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NOTICES:—All communications relating to editorial matter should be addressed to the Editor, who will be pleased to consider articles or contributions dealing with modern chemical developments or suggestions bearing upon the advancement of the chemical industry in this country. Communications relating to advertisements or general matters should be addressed to the Manager.

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British Chemical Plant

THE types of British chemical plant illustrated and described in this issue do not pretend to be comprehensive, but they serve to suggest something of the strength of the British chemical plant manufacturers' position and the variety and excellence of his productions. Constructional engineering in this country has long had one great asset. A British installation is built to work and to wear. It may in some cases cost a little more at the outset than some superficially attractive rival productions, but even where there is a slight additional initial cost that is speedily compensated for by efficiency, by freedom from worry, and by smooth running and good wear, without the continual need for tinkering repairs.

In the chemical field, where continuous processes are so common, these advantages are more than usually important. In the matter of raw materials specially designed to resist the action of acids, high temperatures, and other strains, the British chemical engineer is singularly fortunate in the wide choice of metals and alloys of unusually high degrees of resistance. Combined with that, there has been a steady advance in the science of chemical engineering, especially in the new field of high pressures and temperatures, and where we had formerly to look to other countries the home user may now confidently rely upon home productions. There are comparatively few lines in which foreign firms excel British, while there are many more in which British firms stand supreme. This may be emphasised with some frequency because the position has latterly been strengthened by the excellent educational work carried out by such bodies as the Chemical Engineering Group, and by the frequent conferences and interchanges of opinion among our leading authorities.

Comparing the position to-day with that at the close of the war, there has been remarkable progress in linking up engineering with chemical science and industry, and some of the greatest triumphs of recent years have been distinctly engineering triumphs in the chemical field. The synthetic ammonia plant at Billingham is perhaps the most outstanding example, although it does not stand alone. The particulars published to-day of the new high-pressure steam-raising installation for this works are interesting in two respects. It is the largest installation of the kind, with one exception, we understand, in the world; it illustrates the advance in the use of pulverised fuel. These developments are not merely of domestic interest to this country; they are of great interest overseas, in the sense that new areas that are constantly being developed largely by means of chemical engineering skill are learning to look to the British market for the soundest and most efficient equipment.

Agricultural Analysts' Fees

THE Public Appointments Committee of the Institute of Chemistry (a body that includes among its Fellows nearly all the official agricultural analysts of the country) has gone very thoroughly into the position of official agricultural analysts appointed under the Fertilisers and Feeding Stuffs Act of 1926. The operation of the old Act was mainly concerned with the detection of adulteration, with misstatements in transactions between merchants and farmers, and with the penal suppression of malpractices. The new Act, in addition to all this, is largely civil in character and wider in its scope, and may be used to control transactions between exporters and importers, manufacturers of and dealers in all kinds of fertilisers and feeding stuffs, as well as retail sales to farmers. The work, accordingly, promises to be substantially increased in responsibility and volume, and the view of the Institute is that this should be equitably recognised in a new scale of fees. Among other reasons for this revision it is pointed out that, for the most part, the fees at present paid to analysts were fixed at a time when almost every expense entailed in conducting a chemical laboratory was substantially lower than it is to-day.

For the guidance of local authorities in fixing fair fees, the Council has drawn up a graduated scale, based on the fact that the extent of information required in an analysis varies according to the commodity. For example, in a sample of superphosphate all the information usually required is the percentage of soluble phosphate, whereas in a compound fertiliser the analyst is expected to state the percentage of soluble phosphate, insoluble phosphate, nitrogen, and potash, with, in some cases, even more detailed information. The fees suggested, which certainly do not appear excessive, are the following: (1) For analysis of a fertiliser or feeding stuff limited to the determination of a single item only, not less than £1 1s. per sample; (2) where the determination of two separate items is required, not less than £1 11s. 6d.; (3) for fuller examination, according to the complexity of the analysis required, £2 2s. to £3 3s.; (4) in cases where the number of samples is likely to be small and a flat rate is preferred by the local authority, an all-round fee of £2 2s. per sample. All interested in analytical duties will recognise this as a typically useful piece of Institute work.

Labour Conditions at Leuna

ELSEWHERE in this issue a summary is published of reports of a visit paid by representatives of the German non-technical Press to the Leuna works of the I.G. A Berlin newspaper recently published a description of conditions at these works which was apparently, in the opinion of the I.G. directorate, calculated to lead to misunderstandings. With the object of correcting any wrong impressions, invitations were issued to a large number of periodicals to visit the works. From a perusal of the reports (a number of which are quoted by the *Chemiker-Zeitung*, which emphasises the fact that the technical Press was not invited), it seems that the manœuvre was not so successful in producing the desired impression as it might have been.

The Press reports give details which indicate the enormous range of recent developments at Leuna, but at a time when Imperial Chemical Industries, Ltd., is developing a great labour programme, and its chairman (Sir Alfred Mond) is leading a national movement for "co-operation in industry," the labour conditions at Leuna have a special interest. Ninety-two per cent. of the workers, it is stated, are engaged in 54 or 56-hour weeks, and this entails regular Sunday work (including a 16-hour shift on one Sunday in every three). In addition, the "town" which has been built to accommodate the employees only provides for 6–7 per cent. of the total number, with the result that the majority have to live at some distance from the works. A large number of them are described as living at places so far as 24 to 36 miles from the scene of their labours, so that a considerable amount of time must be spent in travelling. A total period of work, plus travelling, of eleven to twelve hours a day obtains in most cases, and in the rest it may rise as high as 14 hours a day or more.

With all possible respect and admiration for the high efficiency with which the directorate of the I.G. carry on their affairs, it seems that some aspects of the task they set themselves in building up a giant organisation have proved difficult. This is not altogether surprising. In round figures, the total number of persons employed at Leuna may be put at 22,000. Including wives and families, the number of people dependent on the works can be regarded as about 100,000—enough to fill a town of very fair size. It must be recollected that this is only one of the I.G. works, and therefore the social problems raised here are only a part of those which will have to be dealt with. It seems that the present programme of building at Leuna aims at under 3,000 dwellings, so that the vast majority of the workers must live elsewhere.

Whether the problem will be solved, and how, remains to be seen. Large works, together with model townships for housing the workers, are no new thing, but the I.G. has laid its plans on such a scale that problems of hitherto undreamt-of magnitude seem to have arisen. It seems likely that in the fairly near future mammoth works will be the rule rather than the exception, and the social aspects of the difficulties which arise will obviously have to be dealt with by entirely new methods.

A further point of importance is the question of fumes. At Leuna there were noticed not only ammonia and nitrous fumes, but also those arising from the coal liquefaction plant, which is not yet quite complete. It is difficult to determine, from the comments of the German newspapers, how serious this question is; in some cases the matter is discussed in very strong terms, while in others it is contended that the nuisance is no worse than at any other chemical works. Here, again, it seems that the main factor is that of magnitude, and again it is clear that the problem will have to be handled in a bold manner.

The Club Dinner

THE Chemical Industry Club dinner, to be held this year at the Connaught Rooms, on Friday, February 3, promises to be as popular an event as ever. It is no secret that the Club authorities have schemes in view for improving the present accommodation, extending the membership, and strengthening the established position of the Club as the social centre of the chemical community. It is possible that some reference may be made to these developments at the annual dinner, and members and friends therefore have a special reason for making the dinner a good starting-off point this year. As we have pointed out often before, the steady membership of the Club, the fact that it has always paid its way out of its own resources, and the extent to which it is daily used, demonstrate that from the outset it has met an obvious need that was unmet before. There is, however, a growing feeling that the full possibilities have not yet been thoroughly explored, and the intention of giving the Club a still larger and more important place in the chemical organisations of the country will strongly appeal to its supporters. This seems an additional reason for making an extra effort this year to secure the complete success of the annual gathering.

The arrangements, we believe, promise an interesting evening. The speaking will be comparatively short, and a good portion of the time will be given up to the social side, which has become a feature of chemical

dinners in recent years. The principal speaker will be Sir Ernest Benn, who has latterly become so well-known as a publisher, particularly of a first-class chemical and technical series of standard text-books. He will propose the toast of the Club, and Dr. Dehn, the chairman of the Club Committee, who will preside, will reply. There are still, we understand, some vacancies, and it would appreciably help the labours of the Committee if early application for tickets were made to the Secretary at 2, Whitehall Court, S.W.

I.G. Patent Figures

SOME remarks recently made in THE CHEMICAL AGE respecting the large proportion of British patents held abroad, especially in Germany, have induced inquiry to be made as to the actual figures, as far as they can be unofficially estimated. The effect is to emphasise rather than to weaken the original impression. The number of patents originally taken out by the Badische Co., Bayer and Co., Meister, Lucius, und Bruning, and other German companies, was in no way remarkable. In 1924, for example, they were below 100. The patents taken out by the I.G. (including these former separate companies) in 1925 exceeded 200, in 1926 they were nearly 400, and last year they rose to well over 800. As compared with this figure, the inventions patented by the remaining German and Swiss companies were singularly few, the highest figure, that for the Society of Chemical Industry in Basle, being about 25. The British chemical companies show moderate figures. The British Dyestuffs Corporation (incorporated in Imperial Chemical Industries) is at the head with nearly 100; British Celanese, Ltd., comes next with rather less than 90, and Scottish Dyes, Ltd., has about 25 to its credit. The I.G. output in British patents for 1927 represents more than two-thirds of the total, and indicates an extraordinary activity in chemical research and in patenting everything that may be of service in the future.

In This Week's Issue

Some remarkable new steam-raising plant is being installed at the Synthetic Ammonia and Nitrates Works of I.C.I. at Billingham (p. 70).

A number of recent developments at the Leuna works of the I.G. and details of the labour conditions prevailing there have been reported in the German Press (p. 71).

The inquiry into the complaint that calcium biphosphate of baking powder quality had been improperly excluded from the list of articles dutiable under the Safeguarding of Industries Act was continued, partly in camera (p. 79).

The appeal of Sharpe and Dohme, Inc., against the judgment of Mr. Justice Astbury in the hexyl resorcinol patent action was continued and the case for the respondents was opened (p. 80).

The application of the Merchandise Marks Act to glue, etc., was inquired into and the hearing concluded (p.79).

Books Received

REPORT OF AN ENQUIRY INTO APPRENTICESHIP AND TRAINING FOR THE SKILLED OCCUPATIONS IN GREAT BRITAIN AND NORTHERN IRELAND. 1925–1926. London: H.M. Stationery Office. Pp. 110. 3s. 6d.

INORGANIC CHEMISTRY. VOL. II. MAINLY METALS. By G. H. Bailey and D. R. Snellgrove. London: University Tutorial Press, Ltd. Pp. 430. 6s. 6d.

THE CHEMISTRY OF WATER AND SEWAGE TREATMENT. By Arthur M. Buswell. New York: Chemical Catalog Co. Pp. 362. $7.00.

THE JOURNAL OF THE ROYAL TECHNICAL COLLEGE, No. 4, December, 1927. Glasgow: Royal Technical College. Pp. 128. 10s. 6d.

The Calendar

1928		
Jan.		
28	Mining Institute of Scotland: Jubilee Dinner. 6.30 p.m.	Grosvenor Restaurant, Glasgow.
30	Royal Society of Arts: "The Scientific Foundations of the Refining of Petroleum." Dr. A. E. Dunstan. 8 p.m.	John Street, Adelphi, London.
30	Institute of Chemistry and Society of Chemical Industry (Yorkshire Section): Discussion on "The Phenomenon of Wetting and Its Industrial Significance."	The University, Leeds.
Feb.		
1	Society of Public Analysts. 8 p.m.	Burlington House, Piccadilly, London.
1	Royal Society of Arts: "Some Modern Aspects of the Cultivation of Para Rubber." C. H. Wright. 8 p.m.	John Street, Adelphi, London.
1	Oil and Colour Chemists' Association: Debate with the Incorporated Institute of British Decorators. "The Painting of Plasters and Cements, New and Old." 7.30 p.m.	Painters' Hall, Little Trinity Lane, London.
2	Chemical Society: Ordinary Scientific Meeting. 8 p.m.	Burlington House, London.
2, 9, 16	Royal Institution: "From Faraday's Note Books." Sir William Bragg. 5.15 p.m.	21, Albemarle Street, London.
3	Royal Institution: "Photosynthesis." Professor E. C. C. Baly. 9 p.m.	21, Albemarle Street, London.
3	Chemical Industry Club Dinner.	Connaught Rooms, London.
9	Society of Dyers and Colourists (Midlands Section): "Action of Alkalis on Cotton and Art Silk." A. J. Hall. 7.30.	University College, Nottingham.
9	Institute of Metals (London Section): "Properties of Metals and Alloys at High Temperatures." R. G. Batson. 7.30 p.m.	83, Pall Mall, London, S.W.
10	Society of Dyers and Colourists (Scottish Section): "The Relation between Laboratory and Bulk Production." Dr. H. H. Hodgson.	Glasgow.
10	Chemical Engineering Group: "Dry Cleaning and Finishing Machinery." E. A. Alliott. 8 p.m.	Burlington House, Piccadilly, London.
10	"Chemistry in Mediæval Islam." Dr. E. J. Holmyard. 5.30 p.m.	University College, London.
13	Ceramic Society: "Practical Experience of Firing Refractory Materials with Oil." F. West. "Florida Clay in China Bodies." C. E. Jackson and A. Heath. 7.30 p.m.	North Staffordshire Technical College, Stoke-on-Trent.
13, 20, 27	Royal Society of Arts: "Fatigue Phenomena, with special reference to Single Crystals." H. Gough. 8 p.m.	John Street, Adelphi, London.
16	Society of Chemical Industry (Birmingham and Midland Section): Communications from the Birmingham University Department of Chemistry, by Dr. W. J. Hickinbottom and Dr. E. L. Hirst. 7 p.m.	Latin Theatre, University, Edmund Street, Birmingham.
17	Society of Dyers and Colourists (Manchester Section): "The Standardisation of Fastness of Coloured Textiles." F. Scholefield.	Manchester.
17	Society of Dyers and Colourists (London Section): "The Dyeing of Gloving and Clothing Leathers." M. C. Lamb.	London.
21–24	Fuel Conference at Birmingham. Arranged by Society of Chemical Industry, Institution of Gas Engineers, Coke Oven Managers' Association, and the Institute of Fuel.	Midland Institute.
Mar.		
9	Institution of Chemical Engineers: Annual Corporate Meeting	London.

Billingham's New High-Pressure Steam Plant

The Progress of Pulverised Fuel

The continual developments at Billingham-on-Tees of Synthetic Ammonia and Nitrates, Ltd., is illustrated by the installation, described below, of an immense new high-pressure steam-raising plant, in which pulverised fuel will be used.

ALL concerned with the progress of British engineering will be interested in the steam-raising plant now being constructed for Synthetic Ammonia and Nitrates, Ltd., at Billingham-on-Tees. This extension to the firm's plant will be the largest high-pressure plant in the world as an industrial unit, and it will be designed and constructed throughout by International Combustion, Ltd. Every detail of the plant will be manufactured in this country. The United States, which previously held the premier place in the construction of large pulverised fuel plants, has now had to yield this position to the achievements of British engineers.

In view of the oft-expressed opinions of Sir Alfred Mond that this country must definitely take the lead in matters of fuel research, utilisation, and conservation, it is gratifying to know that this policy has so rapidly been fulfilled. The fact that this extension, like others recently made, is to be constructed on the "Lopulco" system of pulverised fuel firing is a direct recognition of the high economic value of pulverised fuel, and also of steam pressures much higher than previously used.

Highest Pressure Yet Employed

The pressure to be employed in the Synthetic Ammonia and Nitrates installation is 800 lb. per square inch, which, with the exception of the Milwaukee (U.S.A.) undertaking, where one boiler operates at 1,300 lb. pressure, is the highest yet employed. Considerable reluctance has been shown in regard to adopting pressures higher than from 300 to 400 lb. In Germany the highest pressure employed so far has been 495 lb., and the highest figure among American plants, apart from that already mentioned, is the Crawford Station, where 675 lb. pressure is adopted.

It is interesting to note that the whole of these high-pressure plants are associated with the use of pulverised fuel firing, a system which has made it possible to employ a plant on lines that will provide the greatest economy in steam-raising. The plant at which previously the highest pressure was employed in this country is that of the Leeds Corporation new electricity extension, the boilers working there at 450 lb. pressure. This contract also was placed in the hands of International Combustion, Ltd.

Details of the New Plant

In the new plant for Synthetic Ammonia and Nitrates, Ltd., each of the six boilers will be of special construction and of a capacity of 269,000 lb. maximum evaporation, the final temperature being at the high figure of 840° F. The design of the pulverised fuel plant will be on the bin and feeder principle, every wall of the combustion chamber being entirely water-cooled. The new type of "R" burner recently evolved by International Combustion, Ltd., will be embodied. One advantage of this is that it will effect a considerable reduction in the size of the combustion chamber; another is that it will obviate any possible segregation of the fuel. The Raymond Mills, which will be installed for grinding coal, are to be designed on the closed system. No dryers are to be employed, the drying of the coal being effected in the mill circuit. The plant for handling coal will be on a larger scale than any yet adopted, and will have a capacity of 3,800 tons per day. For ash sluicing, the "Usco" system will be used. The volume of steam to be dealt with from this plant every 24 hours will amount to 11,700 tons, this being passed through high-pressure turbines for the production of electricity.

New Boiler Construction

An important innovation is made in connection with the boilers. These will be entirely rivetless and seamless, a practice which will undoubtedly spread very rapidly, more especially when the results of such changes are fully realised. The solid forgings to be adopted have the advantage, also, of comparative cheapness.

Another significant feature of this installation is the introduction of the vertical tube type of boiler, by the adoption of which Imperial Chemical Industrials are following the example set by the Milwaukee Electric Light Co., in their 1,300 lb. boiler plant.

Pulverised Fuel Progress

The year 1927 may be regarded as the year in which pulverised fuel firing established its right to a leading position in combustion processes. Power-station engineers, hitherto dubious as to the greater advantages offered by the use of pulverised fuel, have practically throughout the whole country recognised the accuracy of the assertions of American engineers as to the value of the system. In America the total heating surface in this form of firing amounts now to nearly 7,000,000 square feet. In the year 1924 the total heating surface amounted to 2,100,000 sq. ft. In Great Britain and Ireland the total heating surface under pulverised fuel now amounts to 862,626 sq. ft., a figure which has been attained within two years.

Other countries have also substantially recognised the superiority of this form of firing, where large demands for power are required to be met. The large new stations at Congella, South Africa, at Buenos Ayres, and at Shanghai are all being equipped with pulverised fuel plant, while Germany has long recognised the advantages associated with this description of firing for large boiler plants as well as for metallurgical furnaces.

It may be noted that the power stations and industrial plants in Great Britain operating on the "Lopulco" system include the largest and most recent additions to our power-plants.

Advantages of Pulverised Fuel

Among the principal reasons which account for the rapid increase in the use of pulverised fuel are improved thermal efficiency, greater operating convenience, reliability, and a wider choice of fuels. What really interests the power-station engineer is the average efficiency taken over prolonged periods under ordinary station operating conditions, and in this connection there is no doubt that the pulverised coal-fired boiler scores. With this system of firing, also, almost any grade of fuel may be efficiently consumed. The fuels that have been successfully consumed in powdered form include the whole range of bituminous and semi-bituminous coals, anthracite coals, lignite, brown coal, and even pitch. With this system the lowest grades of coal produced, and fuels which have hitherto been regarded as useless, are made available for power production. Such low-grade fuels cannot be employed in ordinary practice under the fluctuating load conditions encountered in an electric generating station, without considerable sacrifice of efficiency and reduction in the steaming capacity of the boilers.

The fuel may be purchased almost solely on a basis of cost per unit of heat without regard to its physical condition, and this constitutes a great economic advantage to the majority of plants.

There are also marked advantages from the operating point of view, as the fuel is practically gaseous, and combustion control is almost as simple as with gas firing. In many pulverised fuel-fired installations, automatic control has been introduced, and in some cases the whole operation of the plant is carried out electrically from a central control cabin.

British Industries Fair: All Space Booked in London

ALL space in the London section of the British Industries Fair, at the White City, Shepherd's Bush, from February 20 to March 2, has now been let, and the Department of Overseas Trade has announced the formation of a waiting list for the Fair of 1929. Acceptances from overseas buyers to the British Government's invitation to the Fair show an increase of more than 100 per cent. on the number received at the same stage last year. Buyers are coming from 67 countries, a record number. Holland heads the list as before. The United States, Canada, France, Switzerland, Italy, Belgium, and India follow, in that order.

Labour Conditions of German Chemical Workers

German Press Reports on the Leuna Works

A Berlin newspaper having recently published certain critical statements with regard to the conditions obtaining in the Leuna works of the I.G. (where synthetic nitrogen compounds and synthetic oil are made), the directorate of the I.G. invited the representatives of the German Press to visit the works in question. The "Chemiker-Zeitung" (which emphasises the fact that the invitation did not include the German chemical Press) has collected and analysed the accounts of the visit published by various German newspapers, and a summary of the more important points is given below.

The Oppau and Merseburg works of the I.G. together cover 3,200 acres. They form a complex of 400-600 small and large works, the main ones being large halls built of iron or ferro-concrete. The Leuna works has 65 locomotives and 2,000 railway wagons. The railway traffic in 1926 totalled 4·9 million tons ingoing, 6·7 million tons outgoing, and 0·9 million tons within the works. On December 15, 1927, the total number of persons employed was 21,914, composed of 19,001 workers, 1,143 overseers, 377 technical officials, 228 research workers and engineers, 1,113 commercial officials, 8 doctors, 18 nurses, 9 health assistants, 15 teachers, and 2 children's nurses. In addition 4,820 building operatives were occupied in the works in mid-December. The present building programme aims at 2,874 houses.

Crude lignite to the amount of 14,000 tons is brought daily into the Merseburg works from the I.G. mines at Geiseltal. In the near future this will rise to 28,000 tons a day. The Merseburg ammonia works manufactures much of its own requirements of plant and apparatus. The repairing shops keep 10,000 metal workers employed. A good deal of interest attaches to the first Winkler generators, now in course of erection, which are to be used in the future for the production of water gas from crude lignite. There are a number of 3,000 H.P. gas engines. The daily production of gas in the Leuna works is 6,000,000 cubic metres, which would be sufficient for the needs of Berlin for four days.

Synthetic Ammonium Compounds and Nitrates

In the projected building programme a great point is made of the catalytic production of nitric acid from ammonia and air. The plant is to be built of Krupp non-rusting steel and aluminium. The programme aims at the conversion of half of the output of ammonia to nitric acid, with a view to the final production of calcium nitrate (for which purpose the calcium carbonate obtained as a by-product in the production of ammonium sulphate will be utilised). There will thus be a decreased proportion of ammonium sulphate, and this is probably deliberate, since it has been stated that the constant use of this fertiliser gives rise to acid soils. Although it has been urged that this is due merely to insufficient liming, a disinclination to the use of ammonium sulphate has arisen in some agricultural circles. Calcium nitrate, it is said, will supply the soil at once with nitrogen and lime.

One of the concrete silos at the works, 345 metres long, 55 metres wide, and 35 metres high, is capable of holding 250,000 tons of fertilisers, for the transport of which 25,000 railway wagons would be necessary. The total I.G. annual production of synthetic nitrogen compounds is at present equivalent to 600,000 tons of nitrogen. The needs of German agriculture amounted in 1926-27 to 400,000 tons of nitrogen, as compared with 185,000 tons in 1913-14. The exportable surplus amounted in 1926-27 to 165,000 tons, as compared with 95,000 tons in 1913-14. In the fertiliser year 1928-29, the total I.G. production of synthetic nitrogen compounds will be equivalent to 700,000 tons of nitrogen.

As regards the liquefaction of coal, it appears that the installation will not be completed until the spring of this year. Only a few parts were working when the works were visited. Lignite is also being pressed and distilled for the production of oils and benzine (1,200 tons per month, later 10,000 tons).

Labour Conditions

With regard to the question of labour conditions, on which the Press criticisms had been made, it is difficult to form an opinion. There seems evidence for the fact that ammonia and nitrous fumes give rise to some discomfort. No case of poisoning from nitrous gases has yet arisen at the Leuna works. Those cases which have occurred have been due to carbon monoxide. Definite details on the nature and type of diseases and accidents were unobtainable. The national accident-rate for Germany is 6·9 per 1,000, for the German chemical industry 5·9, and for the Leuna works 5·2. Discipline is very strict, and precautions are taken against espionage. 3,000 of the employees work a 48-hour week; 10,000 work a 54-hour week; and 6,000, engaged on continuous production, work 8 hours a day (three shifts working in 24 hours), or a 56-hour week. 92 per cent. of the employees work 54 to 56 hours per week, which involves Sunday working, about which there is some dissatisfaction. On successive Sundays these latter work on the first Sunday from 10 a.m. to 6 p.m., on the next for a 16 hour shift, and on the third from 10 p.m. to 6 a.m. Owing to the fact that many of the employees are unable to live near the works, long hours must be spent in travelling, so that the actual time spent in work and travelling is generally as much as 11-12 hours per day, and in many cases more. It is stated that a third of the employees come daily from places as far as 24-36 miles from the works, and even farther.

Close to the works is the living quarter, having a large modern hospital and a school. The number of residents is 5,000, composed of officials and key-workers. At the end of building operations the settlement will contain 2,874 houses. There is some complaint as to atmospheric pollution. On the whole, this question of the proper housing of workers—in order to give them an opportunity of living fairly near to the works, but under good conditions, in order to obviate much travelling to and fro—seems to be one of the most serious difficulties.

The Faraday Society Meeting

An ordinary meeting of the Faraday Society was held at Burlington House, Piccadilly, London, on Wednesday, at 8 p.m. The following papers were down for reading: "A method of measuring variations of electrical resistance for the determination of the thermal equilibrium diagram of an intermetallic system," and "The Lead-Tin System of Alloys re-examined by an Electrical Resistance Method," both by F. H. Jeffery; "A new method of measuring over-voltage," by L. J. P. Byrne; "Modifications of the Sand auxiliary Electrode," by T. B. Smith; "Overpotential at Metallic Cathodes: Silver in Neutral and Alkaline Solutions," by J. Grant; "On the Persistence of Potential at a Mercury Cathode on Open Circuit," by F. P. Bowden, jun.; "Maxima on Current Voltage Curves. I. Electrolysis of Nickel Salt Solutions with the Mercury Dropping Cathode," by N. V. Emelianova and J. Heyrovsky, and "II. Maxima on the Polarisation Curves of Uranyl Salt Solutions," by P. Herasymenko; "Electroreduction of Uranyl Salts by means of the Mercury Dropping Cathode," by P. Herasymenko; "The Electrolytic Oxidation of *p*-Toluic Acid in Alkaline Solution," by A. J. Allmand and A. Puttick; "Perphosphoric Acid and Perphosphates," by Syed Husain and J. R. Partington.

Society of Public Analysts: Forthcoming Meeting

The next meeting of the Society of Public Analysts will be held on Wednesday, February 1, at the Chemical Society's Rooms, Burlington House, Piccadilly, London, W.1, at 8 p.m. The following papers will be read: "The Determination of Butter in Margarine," by L. V. Cocks and E. Nightingale; "The Deposition of Metals on Copper from Cyanide Solution. 1. A New Method for the Separation and Determination of Small Amounts of Lead," by B. S. Evans; "Investigations into the Analytical Chemistry of Tantalum, Niobium and their Mineral Associates. X. The Separation of Silica from the Earth Acids. XI. The Precipitation of Titanium by Tannin," by W. R. Schoeller and A. R. Powell; and "The Determination of Carvone in Dill Oil," by Professor Joseph Reilly. Sixteen candidates for admission to the Society will be balloted for.

Some Recent Developments in Chemical Plant

New Productions for the Chemical Industry

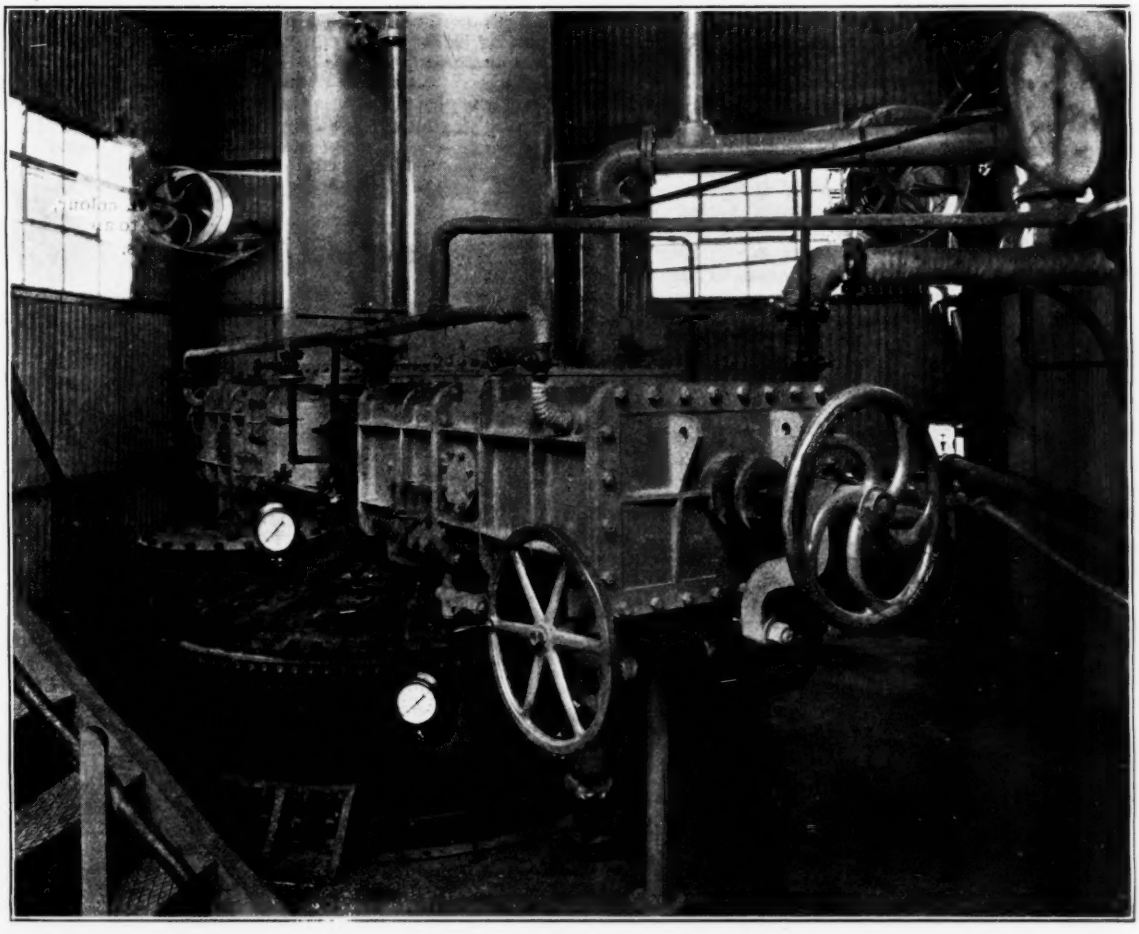
The following notes give a brief description of recent plant for the use of chemical manufacturers. Although in some cases the plant is not entirely new, fresh applications are being discovered and minor improvements introduced to provide for these.

A New Extraction Plant for Oils, Resins and Waxes

GEORGE SCOTT AND SON (LONDON), LTD., inform us that the past year has undoubtedly been the best year which they have experienced for a considerable time, and add that they are disposed to think that trade generally, particularly in chemical plant, is improving. Plant for the extraction of oils, fats, waxes, resins, etc., is one of this firm's outstanding lines, but in so far as the production of oil from oleaginous seeds is concerned this trade has for a number of years been very much depressed. The firm has, however, brought out a new patented plant involving certain entirely novel features which are applicable particularly to materials which must necessarily be dealt with on solvent lines, but which do not permit of the solvent being recovered therefrom on the ordinary principle of bringing open steam into direct contact with the material. The plant comprises a series of percolating tubes, equipped with a patented valve, in direct communication with the solvent recovery vessel. The solvent is recovered from the residual meal, or whatever the product may be, under a high vacuum. As a result, it is possible to eliminate entirely all traces of solvent from the product and at the same time ensure a product which in freedom from oil, and analysis generally, is superior ..y meal which can be produced on the older fashioned line. There are two patents covering this plant, one applying to the plant as a whole and the other to the special valve which is employed. To illustrate the points of this plant we publish three hitherto unpublished photographs of it. One of these is a general view of the whole plant as far as it is possible to secure this. The second is a close-up view of the patent valves taken on the first platform. The third view is a view of the top floor, showing the charging doors on the upper ends of the tubes.

The "Scott" evaporator is, of course, this firm's principal line. In recent years great improvements have been made in its outstanding features, and much work has been concentrated on developing high vacuum devices, with the object of maintaining even on the largest installations a considerably higher vacuum than has been regarded as a practical proposition on such plants. As a matter of interest there are now in course of construction and erection five multiple effects, each of which is capable of dealing with 5,000 gallons of weak liquor per hour. Another plant of interest, the "Scott" patent dryer which has received considerable publicity during recent months as applied to the desiccation of sugar beet, is also something of outstanding importance. This dryer is a satisfactory and efficient dryer in commercial operation for

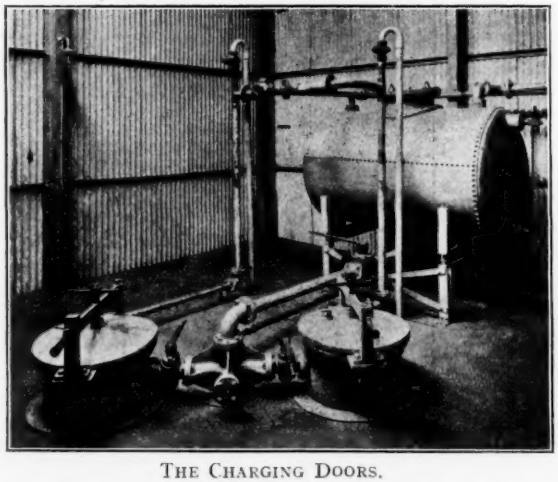
GENERAL VIEW OF THE NEW "SCOTT" EXTRACTION PLANT.



ON THE FIRST PLATFORM: THE PATENT VALVES.

the desiccation of sugar beet, and it is claimed that the results which have been attained in the matter of fuel efficiency have not hitherto been approached.

Apart altogether from its outstanding advantages in the



THE CHARGING DOORS.

desiccation of sugar beet, it has a wide application in many industries. A typical unit is capable of dealing with 100 tons of material per day of 24 hours, containing approximately 75 per cent. to 80 per cent. moisture.

A Super Thickener and Clarifier

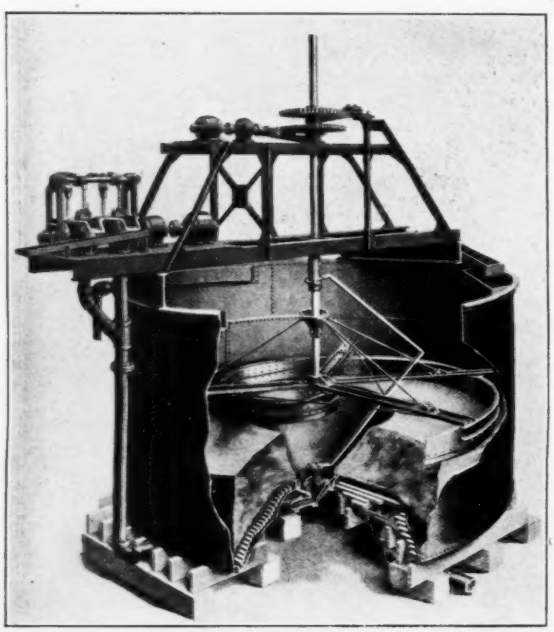
A communication from International Combustion, Ltd., details the advantages to be obtained by using the Hardinge Super Thickener and Clarifier in place of gravity settling tanks and filtration beds. Thickening, as differentiated from clarification, may be considered as the process of removing a large part of the liquid from a mixture of liquid and finely divided solids. The solids must be heavier than the liquid, so they will settle if given sufficient time. The liquid is either decanted or drawn off in other ways. Clarification, as differentiated from thickening, may be considered as the method of removing solids suspended in liquids where the quantity of solids is very small compared with that of thickening, and the solids are not necessarily heavier than the liquid in which they are suspended. The construction of the plant may be gathered from the illustration. The thickener and clarifier, except for minor details, are similar to one another. In the tank is a porous bed with a drain to one side of the centre. The bed is of fairly fine particles, containing little slimes or colloidal matter, and composed of the same substance that is to be thickened or clarified, or any suitable material. A well, separate from the drain, extends through the bed to an outlet beneath it. Suspended from above is a spiral scraper which, as it revolves, scrapes the solids which have filmed over the surface of the bed to the centre well.

Operated as a thickener, the unthickened pulp is allowed to flow into the tank when most of the clear liquid will flow over the edge or effluent weir, and part will percolate through the porous bottom to the outlet in the false bottom. The particles that settle on top of the filter bed are scraped to the discharge well at the centre, and the thickened product is drawn off.

In order to prevent the porous bed from becoming imper-

vious owing to the settling of fine particles, the scraper is lowered slightly (equal to about the diameter of the average filter bed particle) and a thin layer of the bed is scraped to the well. The product scraped into the centre well is made very thick, much thicker than if allowed to settle on an impervious bottom in the ordinary way. The overflow of the solution over the rim may be joined with the filtrate drawn through the filter bed, or the two may be kept separate, as the underflow through the bed is crystal clear, while the overflow, under certain conditions, might contain some slight turbidity.

The practice of depth feeding can be carried out successfully with the super thickener. Among the advantages of the plant it is claimed that a much greater capacity for a given area is secured than with the straight settlement system,



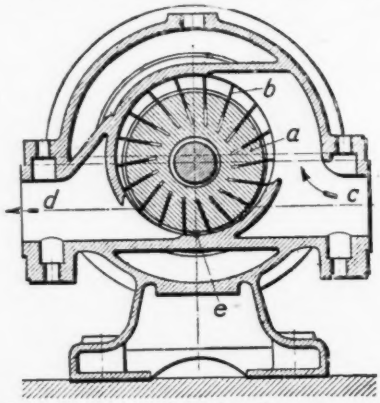
THE HARDINGE SUPER THICKENER.

that lower costs are obtained than when the filtrate is drawn through cloth and that a positive control of the density of discharge material is obtained. The super thickener finds useful application in nitrate works, in thickening and dewatering sludges in cyanide plants and in caustic soda manufacture.

With the Hardinge clarifier, which is, in effect, of the same design as the super thickener, a crystal clear filtrate is always obtained, no matter how thin the layer of sand. The filter medium is so selected from materials at hand that there is no infiltration of the sediment and therefore no retardation of the filtration rates. In ordinary clarification problems, the 5 ft. depth of filter bed, which is usually specified, should last several years without renewing. The mechanism is usually operated intermittently and the cut of the filter bed is much less than when used as a thickener, due to the fact that much less material for a given quantity of liquid is present to start with. The filtrate is crystal clear, the only chance for coloration being where the liquid itself is coloured.

Rotary Air Compressors

Details of new rotary air compressors and vacuum pumps working on the "Crescent Chamber" principle are contained in a catalogue received from the Rotary Air Compressor Co., Ltd., 12, Victoria Street, London. In this machine a cast-iron rotor is mounted eccentrically in a cylindrical casing, and carries a number of steel blades, located in radial slots and water-cooled round the entire circumference. These blades, being thrown out by centrifugal force, form a crescent-shaped working space, thus allowing of the air or gas being drawn in from the inlet (*c*) and finally compressed and discharged through the delivery chamber (*d*). The patented feature of this machine is the introduction of floating rings on the rotor which are so designed and proportioned that they restrain the full pressure of the rotating blades from acting on the wall of the cylinder, and thus diminish both wear and friction. It is claimed that the high speed at which they are designed to run allows of them being coupled direct to standard electric motors, which economises not only first cost, but also space and foundations. The entire absence of reciprocating parts, valves, and springs

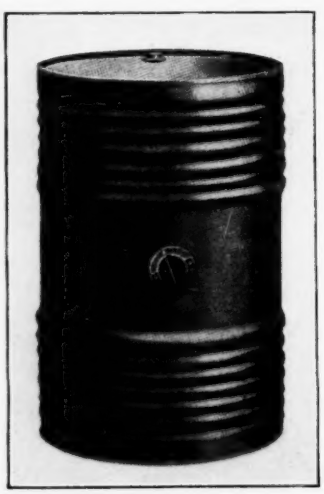


SECTION OF ROTARY AIR COMPRESSOR.

will at once appeal to the engineer as eliminating features which are probably the cause of more delay and maintenance charges with reciprocating machines than any other of their disadvantages. In view of the uniform running of these compressors, air receivers can in most cases be dispensed with, and the diameter of the service pipes may be reduced to a minimum. Compressors are supplied for all purposes and pressures up to 150 lb. per square inch.

Gas Welding Applied to Chemical Plant

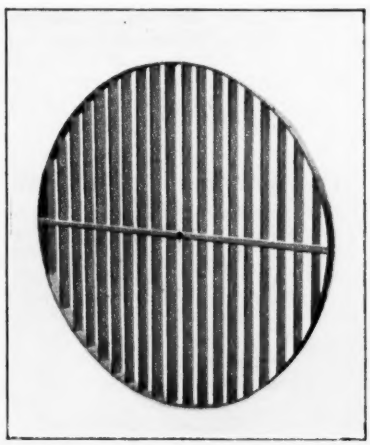
It is difficult to find a manufactured product to-day that does not incorporate welding somewhere or other in its construction, and in some cases it may depend entirely on welding; the characteristic flexibility of the oxy-acetylene flame, its simplicity of operation, and the ease with which it may be adjusted within relatively wide limits, enable the gas



A WELDED STEEL BARREL.

welding process to be employed on complicated welds and classes of work impossible by any other process. Welds can be effected by the oxy-acetylene process without any injurious effect on the metal, and the degree of reliability with which this process is now regarded by engineers, may be judged from the fact that it is employed for the manufacture of

chemical tanks, vats, pipes, gas holders, and boilers. The substitution of welding for casting or riveting in the manufacture of such plant makes for a great saving of time and thus of labour and material, and also reduces to a minimum the need for machining, and in some cases obviates the necessity for this operation. There is, probably no other tool which will save its costs in so short a time for repairs to boilers and tanks, at least in a big works, as an oxy-acetylene welding plant. A point worth the attention of every plant user is the adaptability of the process to various metals, the clean finish of joints and the ease with which intricate



GRID FOR SUPPORTING PURIFYING MATERIALS.

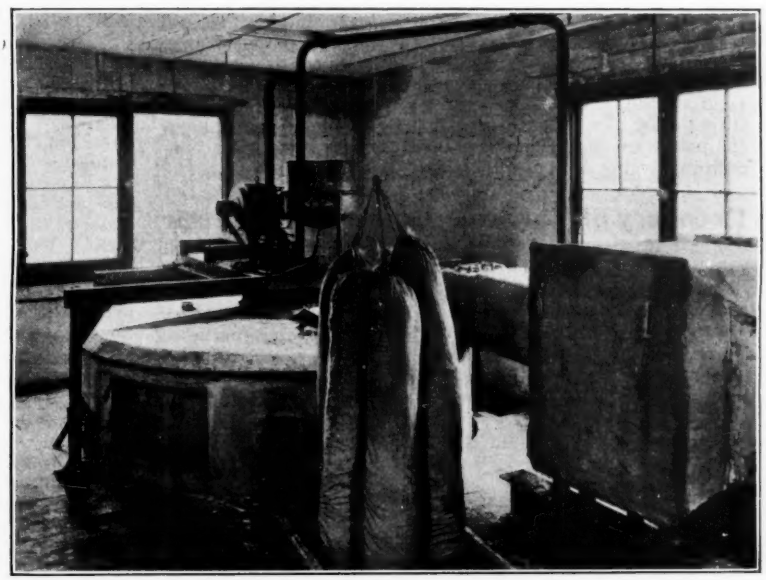
A WELDED SHEET STEEL COOLING TOWER.

work can be done. Aluminium welds, being made with pure aluminium rod, are not subject to deterioration. Bronze welding may be used for repairing broken parts, cracked castings, welding cast iron, steel pipe lines and building up iron parts, while the various alloy steels, such as "Staybrite," and stainless alloys, such as Monel metal, lend themselves to treatment by the process.

Sheet steel in many forms can be satisfactorily joined, as is indicated in the illustration of a sheet steel cooling tower. The photo of the grid for supporting purifying materials is a good example of small and to a certain degree intricate work, while the steel barrel is a good example of a piece of welded material possessing great strength. A point worth noting is that it is often possible to mend by oxy-acetylene welding plant which is impossible of repair by any other process and would have otherwise to be scrapped. Although much research has still to be done before welding entirely takes the place of riveting it has a great advantage for certain processes in that welded joints possess perfect continuity, and is also considerably lighter than riveting. In reference to the use of the oxy-acetylene flame we have received from the British Oxygen Co., Ltd., several booklets on the subject, *Hints on Gas Welding*, *Hints on Oxygen Metal Cutting*, and *Gas Welding and its Applications*.

Developments in Spray Drying

In order that spray drying plant should operate successfully three essentials must be fulfilled: The atomisation of the liquid to be treated, the drying of the dispersed particles, and the removal of the dried product from the air stream. In a recent paper, read to the Chemical Engineering Group, Mr. J. A. Reavell (of the Kestner Evaporating and Engineering Co., Ltd., of Grosvenor Gardens, Westminster, London) described "A Recent Development of Spray Drying," and described a new dryer placed on the market by his company. Mr. Reavell went carefully into the question of jet and disc atomisers. He stated finally that a recent design of disc had been evolved to overcome the various troubles associated with other types. The essential characteristics of this disc



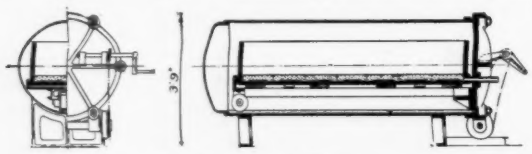
SPRAY DRYER CHAMBER: THE AIR HEATER AND FILTER.

was that the liquor was sprayed from the underside, although the driving mechanism and the feed pipes were situated above the disc.

With the atomiser driven from above and placed in the top of a circular chamber it is possible to dry with a downward current of air. It was advantageous, said Mr. Reavell in his paper, to employ a downward current of air, and the first attempts to design a drying chamber to work with a downward current were of a simple character. The air entered the drying chamber above the atomiser and travelled downwards at a uniform velocity, or, in some cases, it was supplied more intensely at either the centre or at the outer diameter. There were certain difficulties, but these difficulties have now been completely overcome, methods having been found whereby a more efficient mixing of the dispersed liquid and the heated air can be obtained, and whereby the drying time, and consequently the size of the drying chamber of a given duty, can be reduced. The air distributor had been developed and improved. With the latest type the hot air was admitted at a central distributor and at a secondary air distributor, the latter being situated at the outer circumference of the top of the drying chamber. An extended account of Mr. Reavell's description of the new dryer was given in THE CHEMICAL AGE on October 22, 1927, pp. 364–365. The photograph shows the air heater and filter in the spray dryer chamber.

Homogeneous Lead Lining for Pressure Filters

As is well known, homogeneous lead lining has outstanding advantages in all cases where the lead work is to withstand heat, vacuum or pressure, and its adoption greatly reduces the otherwise all too frequent repair bills. S. Bornett and Co., Ltd., specialise in the homogeneous lead lining of pipes by a patented process, which enables an absolutely uniform thickness of lead to be provided in pipes having a maximum length of 12 ft. to 15 ft. A special application of homogeneous

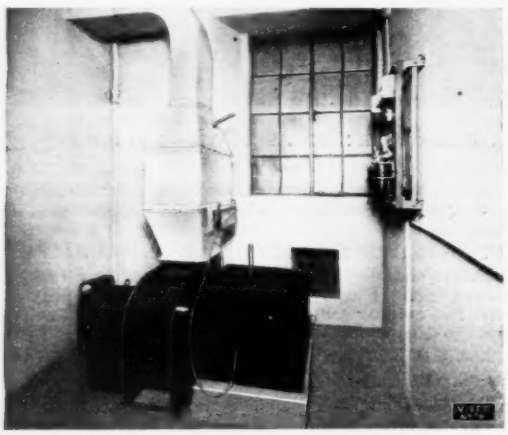


ETA PRESSURE FILTER.

lead lining is the lining of pressure filters, also a speciality of S. Bornett and Co., Ltd., as this method of filtration is particularly applicable to acid liquors. The principle employed is indicated in the accompanying illustration, which shows a pressure vessel containing a tray of any suitable material carrying the filtering medium in the form of porous plates. Filtration is effected continuously, semi-continuously, or intermittently by the admission of compressed air, and to facilitate the removal of cake the trays may be provided with tilting gear. In order to cope with precipitates of any kind, the plates are supplied in chammotte, white silica or carbon, each in varying degrees of porosity.

Recovery of Valuable Dusts from the Air

For the recovery of dust arising in the manufacture and grinding of expensive chemicals and minerals, the "Beth" Tube Filter should prove interesting to fine chemical makers. The Visco Engineering Co., Ltd., have secured the sole agency for Britain and the Dominions for this filter, which is marketed under the name of Visco "Beth" Tube Filter, and which is an improvement on the standard model. The filter consists of a rectangular chamber in which are suspended a number of tubes made of cloth, the top ends of which are closed and are suspended from a shaking gear. The bottom ends are con-



VISCO FILTER INSTALLED IN AN AUTOMATIC TELEPHONE EXCHANGE.

nected to a division plate beneath which is a conical hopper terminating in a spiral conveyor.

Dust-laden air is drawn into the conical hopper below the division plate, the heavy particles falling into the bottom of the hopper and being carried away. The air passes into the tubes above, escaping through the sides of the fabric, which retain the dust. Periodically the air is reversed in direction, passing from the outside of the tubes down into the hopper, freeing the dust from the inside of the tubes, whence it falls into the hopper. During this operation, the liberation of the dust is facilitated by the agitation of the tubes by the shaking gear. A complete plant is made up of two or more sections. In older types the sections were heavily overloaded, having to pass not only the whole of the dust-laden air drawn in but also the scavenging air at the same time.

In the new Visco model the sections are separated and provision is made for the supply of an independent supply of scavenging air. The filter tubes are cleaned without interfering with the rest of the plant. The Visco Co. make, of course, numerous other types of filter, large and small (employing liquid coated rings as the filter medium) such as are employed for cleaning air supplied to alternators, air compressors, and for cleaning the air supply to public buildings and factories. The illustration shows a Visco air filter attached to a generator at a G.P.O. telephone exchange.

Plant for the Reclaiming of Rubber

Although the use of reclaimed rubber in the manufacture of various rubber commodities in this country is comparatively small, in the United States it has reached important dimensions. On account of its cheapness compared with new rubber the use of reclaimed material is of importance to the rubber industry. Much of the reclaimed rubber is made from tyres, the two main processes for reclamation being (*a*) treatment with oil, and (*b*) treatment with alkali under pressure. The breaking down of scrap rubber into "crumb" is an important preliminary stage in the manufacture of reclaimed rubber.

A recent method of preparing scrap rubber for devulcanising has just been evolved by William Gardner and Sons (Gloucester), Ltd., who have introduced a rubber grinding and sifting plant. The grinder consists of a hollow metal drum on the outer edge of which is the grinding surface consisting of a series of serrated edges running parallel to the axis of the drum, and which are made of a steel of a very special kind. Several tyres can be fed automatically to the face of the grinding surface, by special feed rollers, and the ground material is immediately drawn away by air suction to the air separator shown in the rear. The rubber powder is drawn to the rear of the grinder by a fan at the rear end, and is thus passed to the air separator and thence by elevator to a Gardner "Rapid" sifter, which grades the materials.

The temperature of the rubber in grinding is kept down by automatic means, and the whole plant is worked automatically, no skilled labour being necessary. Quite a low horse-power is needed for working the plant, a 25–30 h.p. plant being capable of giving an output of about 1 cwt. of ground rubber per hour.

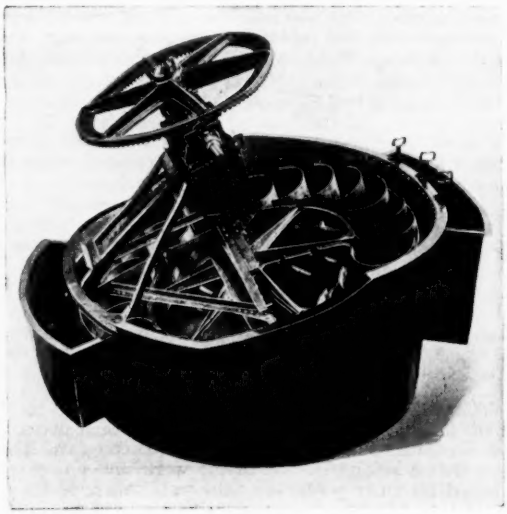
The range of plant made by Gardner's includes combined sifters and mixers for dealing with artificial manures, sifters for use in the paint and colour industry, mixers, drying machines and grinders of many types for dealing with acids in solid form, silica, resin, charcoal and chemicals of various kinds.

Clarifiers and Filters for the Beet Sugar and Cement Industries

The products of the Dorr Co., Ltd., are in use in metallurgical operations in many parts of the world, but the company is continually endeavouring to find further applications for its plant, and have now turned to the cement and sugar industries in its search for new fields to conquer. In the cement industry the Dorr Co. can be of assistance with its slurry mixer, its filter, and its sand washer. The first is a modification of the well-known Dorr agitator, which combines mechanical agitation with circulation by air lift. This ensures thorough mixing without the excessive power requirements of the usual mechanical mixers, which must run at high speed in order to maintain agitation. Eight of these have been sold in the last three months, we are informed. For such work as the filtration of slurries containing granular material liable to segregate the Dorrco filter of the continuous vacuum drum type has special advantages, for this filter requires no tank or agitating gear as the feed is contained inside the drum itself, so that

any fast-settling material settles on the cloth and forms a natural filter medium. The Dorrco sand washer is a strong machine employed in cleaning and grading sand to be used in preparing concrete.

Dorr clarifiers and pumps have become well known in cane sugar practice, but of novel interest is the application of these machines, and the Dorrco filter, in the purification of beet sugar juices at the stage of the process known as first carbonatation or carbonation. It is found that the p_H value of the juice is of great importance in obtaining maximum purification, and a free filtering precipitate, and the Dorr Co., after many experiments, have perfected a system of continuous



A Dorrco Sand Washer.

carbonation with automatic electric control of alkalinity A very free settling precipitate of unusually good filtering properties is obtained, it is stated, and separation is effected by passing through a Dorr clarifier, followed by a Dorrco filter. In this way only a small part of the hot, strong juice is passed through the filter cloth, which is an advantage both from the point of view of saving in cost of cloth and in higher purity of juices, since the tendency for resolution of impurities is minimised. On account of the special filtering properties of the precipitate the loss of sugar in the filter cake is reduced to as low as ·02 per cent. on the beets treated.

A Rapid Agitator for Dye and Chemical Industry

The " Wizard " agitator is a development of the old typhoon system introduced in this country, prior to the war, by the now defunct Typhoon Mixer Co., of London. The adjustment of the mechanism in the pre-war apparatus was dependent upon the human element, but the later development operates quite automatically. The principles of the " Wizard " agitator consists in the introduction into the mixer of current baffles in such a manner as to develop instantaneously the extreme limit of mixing possibility, thus ensuring the extreme limit of homogeneous mixing.

The baffles used to break the flow of the mixing are constructed according to requirements, and are suspended from the top of the mixing apparatus in a framework surrounding the usual vertical agitator. The moment agitation is commenced, the flow of liquid causes the freely suspended and specially shaped baffles automatically to move into a position dependent upon the rapidity of the agitation, and the choice of the shape of the mixer wings. The current developed causes current breakers to rise or fall, breaking up the current entirely, wherever they float. The current can be broken at any special height dependent upon the design of the mixer wings. The mixer can be made in large or small sizes and a special laboratory model is made. The speedy attainment of the utmost mixing possibility is, of course, of importance in many branches of chemical industry, and a mixer having this advantage should prove of great use in sulphonation and nitration, in diazotising, in the purification of petroleum, benzine, or benzole and similar work in which mixing is required to take place without undue heating. The British agents for the " Wizard " agitator are Norman Evans and Rais, Ltd., of 50, Ellesmere Street, Hulme, Manchester.

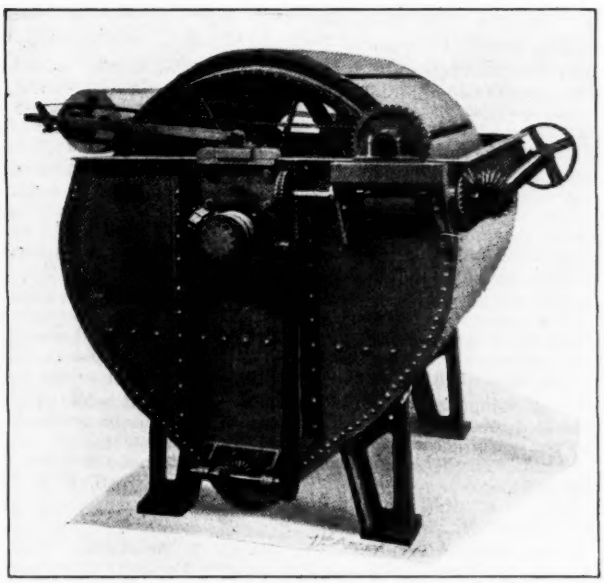
Rustless Steel Pipes and Tank Linings

A long-felt need in the way of steam heating pipes for tanks, etc., has been supplied by the Roto Engineering Co. (Bradford), Ltd., who are making pipes in rustless steel. They also make welded tubes, in all diameters in this material. Another of their specialities is the manufacture of tank linings in non-corrodible steels of any size and shape, to be fitted in skeleton wooden frames. If required these can be fitted with rustless agitators. The firm also specialises in dust extracting plant, fume and steam removal plants, and special ventilating apparatus of all descriptions.

Continuous Filter for Chemical Use

The advantages of continuous rotary filtration have no longer to be proved, but in order to be a practical industrial machine a rotary filter should impose little wear on the filtering cloth, the filtering capacity of which should remain constant at each revolution while the filtering drum should work usefully on practically the whole of the surface of the circumference. The model constructed by the Société des Procédés L. Hertenbein, 52, Boulevard Haussmann, Paris, would seem to possess the necessary characteristics.

This takes the form of a drum made up of a series of interchangeable boxes, each of which is water-tight, with the



The Hertenbein Continuous Rotary Filter.

exception of the outside curved part formed of sheet metal (or other material) with specified perforation, and covered with filter cloth. The drum turns in a reservoir which receives the liquid to be decanted and which is almost entirely submerged. As the drum turns, the boxes are submerged successively into the liquid. When a box arrives beneath the extracting cylinder, there is automatically established a slight air pressure inside the box, the layer of deposited matter is slightly raised up and adheres and rolls itself automatically round this extracting cylinder. The tissue is thus entirely cleared of the filtered matter, and at each revolution resumes its original filtering capacity. As, on the other hand, it does not undergo any friction or scratching, the wear and tear on it is practically nil. A small scraper, supported on the solid cylinder of metal, removes the mud which had rolled round it.

Reviews

ZINC OXIDE. By Dalton B. Faloon, B.S. London: Constable and Co., Ltd. Pp. 145. 12s.

According to the preface "this book has been designed and arranged to help the man who uses zinc oxide in the paint, rubber, oil cloth, ceramics, printing ink, linoleum, etc., industries." Frankly, in the opinion of the reviewer (who uses zinc oxide in one of the industries named) the above object has not been attained. On the other hand, it is stated in the "Introduction" that "there has never been any attempt to give to users the interesting story of zinc oxide before it reaches their plants." Viewed as an effort to fill this supposed void, the author has been more successful.

Two-thirds of the book are devoted to historical observations, the location, composition and smelting of zinc ores and the manufacture of zinc oxide. The description and details given regarding the methods of manufacture are such that they are of very limited value to the user of zinc oxide and are insufficient to anyone seriously interested in its manufacture.

On the other hand, a description of the properties and uses of zinc oxide is confined to two pages only. It is true that certain "suggested" specifications are given for seven different qualities of zinc oxide as well as methods for testing certain simple physical properties and chemical purity. These specifications and methods, however, are very uninspiring and contain a good deal of unnecessary repetition. The last chapter in the book is a reprint of the U.S. Government Specification for Zinc Oxide, dry and in paste, for use as pigments. H. H. M.

COLLOIDS. A TEXTBOOK. By H. R. Kruyt. New York: John Wiley and Sons. London: Chapman and Hall. Pp. 262. 17s. 6d.

This should be a useful book for students, medical men, and those chemists who from purely academic interest would like to understand the principles of modern colloid chemistry—always provided that they possess a considerable knowledge of physical chemistry and mathematics. In comparison, Zsigmondy's substantial treatise is far less loaded with mathematics. Fortunately, a goodly proportion of the mathematical expositions can be skipped without injury to the general trend of the arguments and, we believe, without apparent ill-effects on one's knowledge of the subject. The specialist of any branch of technical chemistry will in vain expect from this volume help and guidance in his practical problems; for these he will have to study weightier and duller treatises. In spite of an abundance of mathematical discussions and formulæ, the subject is treated lightly, the tables are concise, and nearly all apparatus are shown in diagram. A few instruments are briefly described. Just as in almost any other treatise on colloid chemistry the Ostwald viscometer is dealt with, while the Redwood and Engler viscometers, with the aid of which 99 per cent. of the world's business in oils is conducted, are ignored. The book is well printed and the formulæ singularly free from errors. S. P. S.

ELECTRO-ORGANIC CHEMISTRY. By C. J. Brockman. New York: John Wiley and Sons, Inc. London: Chapman and Hall. Pp. 381. 25s.

This substantial compilation of the work done in electro-organic chemistry is, according to the author, the first that has appeared in English since 1905. After a short introduction dealing generally with methods and apparatus, the rest of the book is divided into two parts: Reactions at the anode (oxidation and substitution) and reactions at the cathode (reduction).

In the section on reactions at the anode, there is an introductory chapter dealing with anodes and anode surfaces, catalysts and carriers, solvents, the mechanism of electrolytic oxidation, etc., after which the remainder of the section is devoted to the oxidation of ionised substances (two chapters), the oxidation of non-ionised substances (two chapters), and substitution. As regards substitution, the major part of the discussion deals with the introduction of halogens into aliphatic and aromatic compounds, but other aspects of the subject, such as nitration, diazotisation, etc., are also touched on. The most interesting of the latter group is perhaps the formation of a diazo-compound, at the anode, when a mixture of a nitrite and a salt of an aromatic amine is electrolysed at room temperature, an azo-dye being formed if some suitable coupling substance is present.

The last section of the book deals with reactions at the cathode. It commences with a general chapter, dealing with such matters as speed of reduction, the function of electrode potential, overvoltage, catalysts and carriers, choice of cathode, etc. Then follow four chapters in which the reduction of aromatic nitro compounds is discussed very exhaustively. Subsequent chapters are concerned with the reduction of nitroso compounds, etc.; the addition of hydrogen to unsaturated compounds; the reduction of the carbonyl group (aldehydes, ketones, acids, esters, etc.); and the reduction of compounds containing arsenic, chlorine, sulphur, mercury, etc. The volume is well indexed as regards both authors and subjects.

Alike from the theoretical, practical and industrial points of view, it would seem that this subject has not so far been developed to anything like the extent that it deserves. Future workers in the field of electro-organic chemistry will be very grateful to Professor Brockman for the immense labour and care which have obviously gone to the making of his book. F. B.

MODERN CEREAL CHEMISTRY. By D. W. Kent-Jones, Ph.D., B.Sc., A.I.C. Revised and enlarged edition. Liverpool: The Northern Publishing Co. Pp. 446. 25s.

Books on cereal chemistry can hardly be expected to come under the heading of best-sellers. In view of their necessarily limited circulation, Dr. Kent-Jones is to be congratulated on the fact that a second edition of the work under review has been called for three years after the publication of the first. The book (considering the specialised nature of the subject) is remarkably digestible. This is not due to the fact that the author has in any way shirked the difficulties of his task, but rather to the manner in which he has called to his aid, in discussing many complex phenomena, all the resources of modern physical and colloid chemistry. The subject is discussed under the following headings: Composition of wheat, flour, and classes of wheat; nutritive value of bread; cereals other than wheat; colloidal chemistry; hydrogen ion concentration; strength and the colloidal chemistry of flour; the chemistry of the baking process; composition of mill products; bleaching and flour improvers; conditioning and the effect of heat on wheat and flour; moisture in wheat and flour; and the analysis of flour, etc. The exhaustive and up-to-date nature of the book will render it a standard work of reference among those who deal with flour and bakery products, while the long chapter on analysis makes it an indispensable adjunct to their laboratory bookshelves. Those who wish to consult the original literature of the subject will find the necessary light and leading in the long bibliography provided by Dr. Kent-Jones. F. B.

DIE VISKOSEKUNSTSEIDEFABRIK: IHRE MASCHINEN UND APPARATE. By E. Wurtz. Leipzig: Otto Spamer. Pp. 110. 8 marks.

On one hand this little book marks the standardisation of artificial silk factories; on the other hand it forms excellent propaganda for German engineering firms catering for the artificial silk industries. This one-sidedness is simultaneously its strength and its weakness. It is of great value in collecting particulars of the complete plant of artificial silk factories, for descriptions of which one had hitherto to search the catalogues of numerous firms. With the aid of 59 illustrations it describes the highly-complicated machines which are required to evolve properly finished threads of good tensile strength, for the mechanical aids of this industry are very important. The book gives a fair picture of German practice, and as such fills a gap in the literature of the subject. It is now up to our own engineering firms to issue a British counterpart, because successful competition depends to a great extent on showing the world what our manufacturers can offer. S. P. S.

The Calcium Biphosphate Inquiry

Further Proceedings Before the Committee

THE committee appointed under Part I of the Safeguarding of Industries Act to consider the complaint made by A. Boake, Roberts and Co., Ltd., that calcium biphosphate of baking powder quality has been improperly excluded from the list of articles chargeable with duty under Part I of the Safeguarding of Industries Act, continued the hearing of the case on Thursday, January 19. The earlier part of the proceedings was reported in THE CHEMICAL AGE last week.

Mr. L. R. B. Pearce, B.Sc., A.I.C., a consulting chemist and a chemical merchant trading as L. R. B. Pearce, Ltd., and lecturer in industrial chemistry at the Hackney Institute in 1927, gave evidence on Thursday on behalf of the complainants, and said that both as a chemist and as a merchant he regarded calcium biphosphate of baking powder quality as a fine chemical. He had had experience of the making of both heavy and fine chemicals, including calcium biphosphate. Most assuredly the latter process was one in which care must be exercised; the mere regarding of a description of it did not convey the degree of care necessary, and in order to appreciate the difficulties one must have actual experience of it. Witness agreed that there were a great many acknowledged fine chemicals which had industrial uses. Answering Professor Donnan, he defined an industrial material as one which was used in the arts in large quantities and not for direct consumption by the body. A commercial chemical used for industrial purposes was a chemical produced both for an industrial use and for consumption.

When selling calcium biphosphate he guaranteed it to conform to the requirements of the Food and Drugs Act and of the Board of Trade regulations, and himself received a guarantee from the makers from whom he bought.

Fine and Heavy Chemicals

Mr. Whitehead, K.C., in the course of his cross-examination of Mr. Pearce, described the methods of manufacture of calcium biphosphate employed at the Victor Chemical Works of Chicago, and exhibited photographs of the plant, with a view to showing that those methods, and the large scale on which the material was made, were such as to prove that it was not a fine chemical. In the first place, he said, phosphate rock was treated with sulphuric acid, in a series of tanks, and as many as 13 tanks were used in series. Some had a diameter of 55 ft. and a capacity of 128,000 gallons, and as much as 550,000 gallons of material was treated as one batch. He suggested that a batch of that size—if size of batch were a criterion—would indicate a heavy chemical.

Witness agreed, if size of batch indicated a heavy chemical.

Questions were put by counsel to show that some heavy chemicals were of a high degree of purity, but the chairman interrupted with the remark that in the opinion of the committee heavy chemicals were often just as pure as fine chemicals.

Mr. Cripps, on behalf of the complainants, said that they agreed.

Mr. Whitehead said he thought the degree of purity was put forward as a criterion as to whether a chemical was fine or heavy.

The chairman reminded him of Sir Arthur Colefax's statement that purity, of itself, might not be a test.

Mr. D. L. Howard (managing director of Howard and Sons, Ltd., of Ilford, fine chemical manufacturers) was the next witness. His firm, he said, had made calcium biphosphate of baking powder quality for some years, but had abandoned its manufacture in 1919. He considered it to be a fine chemical. Fine chemicals did find a place in industry, and were used by his firm in their manufacture as raw materials.

Mr. A. S. Wood, director of the Fermentine Co., of Islington, merchants in materials for the baking trade, and Mr. H. C. Roberts, a traveller for Clifford Christopherson and Co. (sole agents for "Ibex" brand of calcium biphosphate, manufactured by Albright and Wilson, Ltd., of Oldbury, who had been referred to as the principal manufacturers of calcium biphosphate in this country), also gave evidence.

The remainder of the sitting was given up to hearing evidence in camera, and it was intimated that further evidence in camera was to be taken at the next hearing, which took place on Tuesday last.

Imported Glue and Gelatine

Inquiry Held under Merchandise Marks Act

AT the offices of the Board of Trade on Monday an inquiry was held by the committee appointed under the Merchandise Marks Act into an application for an order for marking imported glue (including glue size) and gelatine. The applicants were the Federation of Bone Users and Allied Trades and the Federation of Hide Gelatine and Glue Manufacturers, and letters were produced from the fish glue manufacturers in support of the application, although the latter did not appear. The committee was composed of Sir H. Llewellyn Smith, K.C.B., Mr. W. Davenport, and Mr. G. N. Barnes. Mr. Carrol Romer represented the applicants, whilst the opponents, a group of the leading merchants and importers, were represented by Mr. Comyns Carr, K.C., and Mr. Cartwright Sharp.

Amendment of Original Application

Opening the case for the applicants, Mr. Romer first amended the original application, which asked for a mark on importation and also a mark on sale order. The mark was now asked on sale only, whilst it was also asked that the marking should only be on 1 cwt. bags and upwards, and not in respect of the small quantities sold retail over shop counters.

Mr. R. Duncalfe, joint managing director of British Glues and Chemicals, Ltd., gave evidence as to the difficulty of distinguishing between imported and British glues.

Mr. Comyns Carr, in cross-examination, put questions alleging that the British glue and gelatine makers were members of a European price maintenance organisation known as the Epidos, and that as the result of the operations of this body during the past two years the wholesale price of glue had increased from £35 to £45.

Mr. Duncalfe admitted that the price of glue had increased in the manner suggested, but doubted whether it was due to the operations of Epidos.

The Epidos Organisation

When Mr. Comyns Carr put some further questions to witness concerning the Epidos organisation, and the percentage of his own firm's output compared with the total in this country, etc., Mr. Duncalfe asked that this part of the inquiry should be held in camera, and the remainder of his evidence, so far as cross-examination was concerned, was given in the absence of the Press and public. When the inquiry was again constituted a public one, Mr. Romer re-examined, and in reply to questions Mr. Duncalfe said that all members of the two Federations making the application were not members of Epidos nor were these two Federations price maintenance bodies.

In the course of a short speech opening the case for the opponents, Mr. Comyns Carr said there was some doubt in those industries in respect of which Marking Orders had already been made as to the value of such Orders, and in the present case he urged that that doubt must be greater than ever.

Evidence was given on behalf of the opponents to the effect that all the large commercial buyers and merchants in this country either knew the source from which their glues and gelatines come or could easily find out. At the same time, it was stated that this information was seldom demanded, for the reason that the large commercial users and large merchants bought on sample or analysis.

The inquiry was closed. The committee will report to the Board of Trade in the usual way.

Society of Chemical Industry: Birmingham Section

THE programme for the session of the Society of Chemical Industry (Birmingham and Midland Section) has just been issued. The officers are as follows:—chairman—Mr. J. C. Mann; vice-chairmen—Mr. W. A. S. Calder, Mr. W. T. Collis, and Dr. D. F. Twiss; committee—Dr. H. W. Brownsdon, Mr. W. A. Benton, Mr. W. C. Davies, Dr. C. A. Fox, Prof. W. N. Haworth, Prof. A. R. Ling, Dr. E. D. Mason, Mr. H. Silvester, Dr. W. M. Hampton, Mr. H. W. Rowell, Mr. W. Salmon, and Mr. T. C. Humphreys; Chemical engineering Group representative—Mr. A. J. Broughall; hon. secretary—Mr. G. King. At Birmingham University on February 16, Dr. W. J. Hickinbottom and Dr. E. L. Hirst will make communications on chemical research work at the University. Dr. W. M. Hampton will lecture on March 16 on "Coloured Glasses."

The Hexyl Resorcinol Appeal

Case for Respondents Opened

THE hearing of the appeal by Sharpe and Dohme Inc., against the judgment of Mr. Justice Astbury in their action with Boot's Pure Drug Co., Ltd., was continued on Friday, January 20, and during this week. Sir Arthur Colefax's opening speech concluded on the ninth day of the hearing, on Friday of last week.

Mr. Cripps, who followed, said that the real question was: "Was it for all practical purposes obvious, without experiment or research, to any skilled chemist in the state of chemical knowledge existing at the date of the patent, which consists of the chemical literature available (a selection of which appears in the particulars of objections), and his general chemical knowledge, that he could manufacture valuable therapeutic agents by making higher alkyl resorcinols, the process to be used being, firstly, the condensation of resorcinol with the higher fatty acid, by zinc chloride or a similar condensing agent, and, secondly, the reduction of the acyl resorcinol so formed by the use of zinc amalgam and hydrochloric acid as the reducing agent."

In reply to Lord Justice Sargant, he agreed that the question would largely resolve itself into the question of what was meant by "obvious." Must there be certainty or could there be reasonable probability?

The Case of Badische *v.* Levinstein

Mr. Cripps, after quoting the case of Badische *v.* Levinstein, which was heard in about 1885, in which Dr. Griess admitted that he had failed to make the analogy from diazo-benzene to diazo-naphthalene, as the patentee had done, cited evidence in favour of his proposition and read the paper of Johnson and Lane with the relevant evidence, in order to show that (*a*) it did not deal with toxicity, (*b*) it did not disclose whether any alkyl resorcinols above *n*-butyl had any therapeutic value, (*c*) it had not disclosed whether hexyl resorcinol existed, nor, if it existed, how it could be made, and, finally, (*d*) there was no information as to *iso* bodies.

On Wednesday, Mr. Whitehead opened the reply for the respondents. He said that Sir Arthur Colefax had practically devoted himself to the proposition that the production of a new and useful chemical substance was sufficient basis of itself for a patent. It was remarkable that this was the very thing the statute said a patentee could not claim. Section 38A forbade the claiming of any chemical substance, save by the special process described, and claimed in the specification.

The Master of the Rolls (when Solicitor-General in 1923) had given a considered judgment which implied that the word "special" in this section connoted that the process must be patentable, and he (Mr. Whitehead) had assured himself that this decision was strictly followed by the Patent Office in regard to all patents for chemical substances.

It was never laid down that an anticipation must give more information than the specification, but Johnson and Lane's paper did in fact give a great deal more information than the patent. Experiments had been made to ascertain the conditions for optimum yield, and the patentees had lifted wholesale from this paper, not merely the proportions but the actual quantities of the reagents. The methods of purification also were lifted from this paper. He contended that the Court were not dealing with a patent for the preparation of a particularly useful germicide, but for the manufacture of a whole class of chemicals.

The Question of Prevision

With regard to the oft-quoted statement that there was no prevision in chemistry, he reminded the Court of the facts which had been incidentally mentioned by the Master of the Rolls, concerning the discovery of Neptune in 1845. The exact position in space of this undiscovered planet had been predicted by science. He also cited Mendeljeef's periodic classification of the elements, and the vast numbers of predictions, not merely as to the existence, but as to the properties of elements, which had since been verified. Finally, after quoting Froude's definition of a science, he asserted that organic chemistry was one of the sciences in which, perhaps, there was the greatest extent of classification and legitimate analogy.

On the question of infringement, he submitted that if the Court adopted the construction of the specification which he would urge, there could be no doubt that he infringed—but the patent would be wholly invalid. If, however, the Court inclined to construe the patent more strictly, it would be found that the defendant's product was not an infringement because it was, in fact, a purer product than was covered by the specification, and had a higher melting point.

The Refining of Cane Sugar

Lecture to Liverpool Chemists

A JOINT meeting of the Liverpool Section of the Society of Chemical Industry with the Liverpool and North Western Section of the Institute of Chemistry was held at Liverpool University on Friday, January 20, when Dr. A. Holt presided over a large attendance.

Mr. Geoffrey Fairrie delivered an interesting and instructive lecture on "The Production and Refining of Cane Sugar," which was extensively illustrated with lantern slides of the various processes as carried out at the factories of his firm in Liverpool and elsewhere. An interesting fact mentioned by Mr. Fairrie was that in Cuba for six months of the year, the work amongst the canes was very hard, but the pay was good. For the other half of the year the Cuban workers were in the habit of going off to America, where they spent the whole of their six months' pay in pleasure, and then when the cane cutting season came round again, they returned to Cuba and worked again for the season.

The Use of Animal Charcoal

Eight and a half tons of cane stalks, Mr. Fairrie stated, were required to produce one ton of sugar. Mention was made of the fact that in America the steamers bringing the cane could berth alongside the factory, whereas in this country it was necessary to convey the cane to the factory by traction over the roads. The filtration of sugar liquids through animal charcoal was first inaugurated in the London refinery of Fairrie and Co. in 1825. The mystery of why this was done was still unsolved, but it seemed sufficient to know that the method was effective so long as the charcoal was in proper condition. There was no such thing as "moist sugar," said Mr. Fairrie; if moist it would stick in the basin, and the proper name for it was "granulated sugar." For nearly two hours Mr. Fairrie described in not too technical terms the whole of the processes which the manufacture of sugar went through from the time of the cutting of the cane to the final stage of the completed product.

Proposing a vote of thanks to Mr. Fairrie, the President mentioned that sugar refining was one of the oldest industries of Liverpool, having been carried on there for over three hundred years. Mr. Alfred Smetham, as representing the Institute of Chemistry, seconded the vote of thanks.

Mr. Geoffrey Fairrie, in acknowledging the vote, extended an invitation to the members to visit his firm's factory in Liverpool, and see for themselves the processes which had been shown on the screen that evening. Subsequently, Mr. Fairrie was entertained to dinner at the University Club.

Scientific Treatment of Petroleum

Dr. Dunstan's Second Cantor Lecture

ON Monday Dr. A. E. Dunstan (chief chemist of the Anglo-Persian Oil Co., Ltd.) delivered the second of his series of three Cantor Lectures before the Royal Society of Arts, on the scientific foundations of the refining of petroleum. He showed some lantern slides illustrating the construction of the modern pipe still and the bubble tower, indicating how the whole of the crude oil could be vaporised *en bloc*, and at the same time split into its commercial fractions.

The lecturer went on to describe the high vacuum distillation of lubricating oils, and the systems evolved by Steinschneider in Europe and Schultz in America—two pioneers in this particular branch of distillation. He then dealt with the chemical aspects of the refining of petroleum by methods involving adsorption, using substances such as fuller's-earth, bauxite, activated charcoal, and clays of various sorts, which possessed a tremendous amount of pore space and surface.

Rubber Lining for Chemical Plant

AN interesting development in the field of chemical engineering is a special rubber lining for vessels used for the treatment of hot hydrochloric acid liquors. The lining for chemical vessels takes the form of a plastic rubber compound, which can be applied to the surfaces of tanks and vessels. It toughens or vulcanises at 90° C. The lining is obtained in sheets of varying thickness. The surfaces of the iron vessels are first cleaned and sweated free from moisture, covered with a special solution and allowed to dry. On this is laid the rubber sheet, carefully rolled to remove all air from between the sheet and the metal. The jointing of two adjacent sheets is done by first rolling down the edge of one sheet, smearing this surface with naphtha, then laying on that the edge of the next sheet and pressing down with a tool heated to 35–40° C. When heated to this temperature the rubber lining becomes soft and dough-like.

Individualist Bookshop Tea Talks

STARTED as an experiment last November, the "Tea-Time Talks" on Mondays at the Individualist Bookshop, 84, Charing Cross Road, London—a rallying point for the Individualist Movement—have met with such success that it has been decided to continue them. On Monday next, Mr. E. S. P. Haynes is to speak on "The Fabian Society"; the following week Mr. G. W. Gough will state "The Worker's Case Against Socialism"; while other addresses are to be given during February by Mr. H. J. Gillespie, on the 13th; Mr. Austin Hopkinson, M.P., who has chosen as his subject "The Basis of Individualism" on the 20th; and Mr. W. W. Paine, the banker, who is to discuss, on the 27th, "The Use and Abuse of Wealth."

The "Talks," at which Miss Betty Benn presides, begin at 5 o'clock, members of the public who attend being provided with tea at a charge of sixpence. A feature of the gatherings is their informality. Questions are invited by the speakers, an opportunity being thereby afforded for an exchange of views. Admission is free and no tickets are required.

It may be recalled that originally the Bookshop, the creation of Sir Ernest Benn and a group of men having a similar outlook, was opened at Marsham Street, Westminster, with the object of combating, by means of the sale of sound economic literature and in other ways, the spread of socialism. Before a year had passed it was found that these premises were not large enough for the purpose, and last August the Bookshop was removed to Charing Cross Road, a step which has been fully justified by the results.

Institute of Chemistry Pass List

THE pass list for the January examinations, 1928, for the Associateship in Chemistry of the Institute of Chemistry, is as follows:—Boudry, C., B.Sc., Rutherford Technical College, Newcastle-on-Tyne, and Central Technical College, Birmingham; Chanmugam, W. R., Chelsea Polytechnic, London; Cooksey, A., B.Sc., Wigan and District Mining and Technical College; Lockwood, H. C., B.Sc., Central Technical College, Birmingham; Lucas, C. E. L., Royal College of Science, London; Maddocks, C. B., University College, Nottingham; Pritchett, E. G. K., B.Sc., Central Technical College, Birmingham; Rhead, A. J., Central Technical School, Liverpool; and Smith, W., Heriot-Watt College, Edinburgh. The examination for the Fellowship in the chemistry and microscopy of food and drugs, held in New Zealand in November, 1927, was passed by Gardner, R., M.Sc.

A Treatise on the Use of Silica Gel

WE have received from Silica Gel, Ltd., a copy of a little treatise "What Silica Gel is and What it Does," a technical treatise in non-technical language, in which is described the use of silica gel for drying blast furnace gases as described recently in this journal. In addition, an indication is given of the application of the gel to oil refining, the recovery of benzol from coke oven gas, refrigeration and pharmaceutical use as well.

Azoic and other Insoluble Colours

Recovering a British Industry

A JOINT meeting of the Manchester Section of the Society of Dyers and Colourists and the Manchester Section of the Oil and Colour Chemists' Association was held on Friday, January 20. Mr. J. R. Hannay presided.

In a paper on "Azoic and Other Insoluble Colours," by Dr. A. E. Everest and Mr. J. A. Wallwork, it was pointed out that in all the colour using industries, the present-day tendency was to demand colours of greater fastness, and that this resulted in the utilising, to a continually increasing extent, of insoluble colours, such as the azoic colours which were insoluble, and produced in the fibre, or the vat colours which were introduced in a form that enabled them later to be converted to an insoluble form when on the fibre. The authors pointed out the obvious connection that existed, when these colours were considered, between the pigment users such as the paint makers, distemper makers, and producers of printing inks, and the textile colour users. While the insoluble colours interested all these classes of industry, the properties required differed with the industry.

Valuable Work of British Firms

Dealing with the azoic colours, the authors contrasted the history of this class of dye with the history of the dye industry itself, pointing out that the application of the azoic colours was first introduced by the British firm of Holliday in 1880, that development of this class of colour later passed almost exclusively into the hands of foreign manufacturers, but that of recent years British work had, to a very considerable extent, reinstated even the most up-to-date of these products on the British market. In this work British Synthetics, Ltd. (now allied with the British Alizarine Co.), John W. Leitch and Co., Ltd., and Major and Co., Ltd., had played a most prominent part, whilst other British firms had also assisted. The development of these colours for both industries was outlined, and processes recently introduced by the authors and John W. Leitch and Co. for the extension of azoic colours to wool and silk were described and contrasted with other attempts in this direction. Examples of this extension were shown.

Charges against Oil and Chemical Merchant

THE final stage in the magisterial proceedings in connection with seventeen charges of fraud and false pretences and offences under the Merchandise Marks Act in connection with the supply of barrels of oil to the Millbay Laundry, Dyeing and Cleaning Co. and the Cornwall and Devon Oil Co., against Herbert Marley Crabbe (52), of 30, Beaumont Terrace, Stapleton Road, Bristol, a former business man in the city, took place at a special sitting of the Bristol Police Court on Friday, January 20. The charges against him were concerned with the alleged giving of short weight by altering the tare of the barrels and supplying less quantities of oil than he purported to supply and charge for, and also mixing oils and lubricants when a special brand was specified. Witnesses called gave evidence as to the difference between tare weights on warehouse notes and those on invoices, and also as to the composition of oils that had been supplied to customers.

Crabbe pleaded not guilty, reserved his defence, and intimated he did not purpose giving evidence. He was committed for trial, bail being granted.

Appointments Vacant

A Senior Lectureship in Physical and Inorganic Chemistry in the University of Melbourne, Australia.—Details from the Agent-General for Victoria, Victoria House, Melbourne Place, Strand, London, W.C.2.—The Registrar of the University. April 23.

Temporary Assistant Chemists in the Government Laboratory.—The Government Chemist, Clement's Inn Passage, London, W.C.2. January 31.

A Readership in Chemistry at Bedford College, London.—The Academic Registrar, University of London, South Kensington, London, S.W.7. February 17.

From Week to Week

THE FRIDAY EVENING DISCOURSE at the Royal Institution on February 3 will be delivered by Professor E. C. C. Baly, on "Photosynthesis."

MR. HENRY MOND, a director of I.C.I., was, on Monday, adopted prospective Conservative candidate for the East Toxteth Division of Liverpool.

SIR JOHN BRUNNER has notified the Southport Liberals of his intention to withdraw from the Parliamentary candidature of that constituency, and states that if he again stands, it will be in a southern or south midland industrial centre.

THE BIRMINGHAM section of the Institute of Chemistry held a joint dinner with the local sections of the Society of Chemical Industry and the British Association of Chemists, on Saturday, January 21, in order to celebrate the Institute's jubilee. Professor A. R. Ling presided.

TWENTY-THREE COMPANIES were, in the year 1927, registered in Scotland in connection with the oil, colour, and chemical trades, involving a total capital of £477,900, as compared with twenty-eight companies of a similar character with a combined capital of £313,700 during the previous year.

THE MINISTRY OF TRANSPORT inquiry into the Port of London Authority's application for new by-laws allowing petrol-laden ships to proceed up the Thames as far as Purfleet, was continued this week. Evidence was given by Dr. A. E. Dunstan (chief chemist to the Anglo-Persian Oil Co.) among others.

A REPORT OF AN INQUIRY into apprenticeship and training for skilled occupations in Great Britain and Northern Ireland, dealing with metal extraction and with the chemical, glass, pottery and allied industries has been issued by the Ministry of Labour and is published by H.M. Stationery Office, price 3s. 6d. net.

THE CHEMICAL AND METALLURGICAL CORPORATION announces that the installation of the hydrochloric acid plant at the corporation works now being erected at Runcorn, on the Manchester Ship Canal, has been completed. The plant is producing acid which is readily absorbed by the extensive local market. The corporation's treatment of platinum concentrates from the Transvaal has proved successful.

MR. H. HOOVER, and also the Secretary of the United States Department of Agriculture, Mr. Jardine, appeared before the U.S. House of Representatives Judiciary Committee on Thursday, January 19, and urged Congressional approval of the bill by which "buying pools" could be organised to oppose foreign commodity monopolies in rubber, potash, sisal, nitrates, coffee, mercury, camphor, and other products.

AN INFLUENTIAL LANCASHIRE SYNDICATE is stated to have completed contracts preliminary to the establishment of an artificial silk factory on Orchard's Factory Estate, Long Eaton, Derbyshire. The main factories are to be converted for the new purpose, and equipped with the latest machinery for the manufacture of artificial silk. The re-equipment of the factory is to begin at once. Some 2,000 hands will be employed.

WE HAVE RECEIVED from Lightning Fasteners, Ltd.—a subsidiary company of Imperial Chemical Industries, Ltd.—a copy of a most attractive booklet entitled, "The Lightning Fastener and Some of Its Applications." Copies of the book may be obtained from the Publicity Department of Imperial Chemical Industries, Ltd., at King's Buildings, Smith Square, S.W.1, or from Lightning Fasteners, Ltd., Lion Works, Witton, Birmingham.

UNIVERSITY NEWS.—*Durham:* Dr. W. A. Waters has joined the staff of the chemical laboratories as a lecturer in chemistry.—*Melbourne:* Dr. E. J. Hartung has been appointed to the chair of chemistry at the University.—*Edinburgh:* A bequest, estimated at about £35,000, has been left by the late James Saunderson, of Galashiels, to be applied for the advancement of technical and scientific study and research in the chemistry and engineering branches of the faculty of science.

THE LONDON COKE COMMITTEE has issued two brochures, one dealing with the use of gas coke in relation to cheap power, central heating, and transport, and the other with domestic coke boilers and open fires. In the Greater London area about 5,000,000 tons of coal are carbonised annually, producing over 63,000 million cubic ft. of coal gas, and, in addition to other valuable by-products, 2,500,000 tons of coke are available for sale, of which 400,000 tons are exported, the rest being consumed locally.

THE AGFA CO. (the branch of the I.G. dealing with photographic products) and an American company known as Ansco Photoproducts, Inc., have arranged to work jointly in the United States. It is intended to create a new company called the Agfa-Ansco Photoproducts Co., which will engage in the manufacture and sale of photographic products in America. Among the members of the board will probably be the following: R. H. Swartwont and H. W. Davis, chairman and president respectively of Ansco; L. F. Loree, president of the Delaware and Hudson Co.: and A. Rothbart, a partner in Hallgarten and Co.

PROFESSOR R. F. RUTTAN has retired from his post as director of the department of chemistry and dean of the faculty of graduate studies at McGill University, after forty years' service.

DR. IRVING LANGMUIR, assistant director of the research laboratory of the General Electric Co. of America, has been awarded the Perkin Medal for 1928 of the Society of Chemical Industry (American Section).

BLEACHING, DYEING, PRINTING and finishing trades are included in the preliminary report (No. 1) of the Third Census of Production dealing with Northern Ireland, which appears in the *Board of Trade Journal* for January 26, 1928.

THE ROYAL PHOTOGRAPHIC SOCIETY has awarded its Progress Medal to Dr. S. E. Sheppard, of the Eastman Kodak Co., in recognition of his researches and publications, which have resulted in important advances in the science of photography.

THE OIL AND COLOUR Chemists' Association has issued, as a separate monograph, the section on "Paints, Pigments, Varnishes and Resins," compiled by some of its members for the *Reports of the Progress of Applied Chemistry*, Vol. XI, 1927.

ELLIOTT'S METAL CO. announces that the offer of Imperial Chemical Industries, Ltd., to purchase the ordinary shares of the company has been accepted by the holders of considerably more than 75 per cent. of the shares of this class. The scheme, therefore, is now an accomplished fact.

THE SOUTH WALES SECTION of the Institute of Chemistry celebrated the Institute's jubilee with a dinner held at Swansea on Saturday evening, January 21. The toast of the "Institute of Chemistry," proposed by Professor A. Tarvener, was responded to by Professor Arthur Smithells.

THE IMPORT INTO RUSSIA of about 240 chemical products now manufactured in that country has been prohibited. These products include certain bacteriological dyes and their components, and a considerable number of chemicals for use in metallurgical industries, in testing gases and water, and in photographic developing agents, etc.

A NEW PUMPING PLANT at the works of Synthetic Ammonia and Nitrates, Billingham, on the eve of its being put into commission, was disabled by a very high tide on the Tees on Sunday. Two dams across a gully containing a pipe line from the Tees to the pump house were partially washed away, and the water worked its way through newly-laid cement into the house.

THE RED TRIANGLE DIARY FOR 1928, issued by the Portland Cement Selling and Distributing Co., Ltd., 27, Buckingham Gate, London, contains data designed specially for architects, surveyors, structural engineers, borough engineers, builders and contractors. It is published from 27, Buckingham Gate, London, S.W.1, and a copy will be sent to any applicant engaged in the above trades.

COLONEL E. O. EATON, of St. Leonards, was sentenced to four years penal servitude at the Old Bailey on Friday, January 20, for conspiracy to defraud the public in connection with the issue of prospectuses by the Chalk Fuel, Power, Gas and By-products Corporation, Ltd. Sir Charles Buckworth Herne-Soame and Robert George Harley, who were charged with him, were each sentenced to six months' imprisonment in the second division.

BEET SUGAR NEWS.—It has been definitely decided by Sugar Industry Auxiliaries, Ltd., to erect a beet sugar factory at Brigg, Lincolnshire. The factory, which will cost £360,000 and will have a capacity of 1,000 tons of beet per day, will be built by Stewart and Partners, Ltd., acting in conjunction with the Hallesche Maschinenfabrik und Eisengiesserei. The consulting engineers are Mr. A. J. V. Underwood and Messrs. Heron Rogers and Pettit.

THE LARGEST NEWSPRINT MILL in the world, with a daily capacity of 1,000 tons, is to be erected at Campbell River, B.C. Construction will begin in the spring. The same interests as are behind the Pacific Mills at Ocean Falls, B.C., are backing the new project. The new mill will overshadow the largest mill in Canada to-day, that of the Canadian International Paper Co. at Three Rivers, with a production of 700 tons per day. British Columbia newsprint mills are reported to be working at capacity. A large proportion of the output is sold to Australia and New Zealand.

EXPORTS OF PHOSPHORIC ACID SALTS, including sodium ammonium phospates, from Germany, increased during the first eight months of 1927 to 7,984 metric tons, from 3,533 tons during the corresponding month of 1926. According to the Department of Commerce the United States was the principal outlet for German phosphates, followed by Great Britain and South Africa. According to American statistics imports of sodium phosphates from all countries during the first eight months of 1927 were 5,463 short tons ($257,604), a marked increase over 1926 receipts of 4,528 tons ($227,932), for the entire year.

Obituary

MR. WILLIAM DUPONT, at Wilmington, Delaware, recently, aged 75. He had large interests in the Hercules Powder Co.

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The titre of New Zealand mutton tallows. A. M. Wright and I. Thompson. *J.S.C.I.*, January 13, pp. 13–14T.

APPARATUS.—Pregl's universal filling applied to macro-combustions. W. Davies. *J. Chem. Soc.*, December, pp. 3161–3162.

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PIGMENTS.—British standard specifications for pigments. C. A. Klein. *J. Oil and Colour Chem. Assoc.*, December, pp. 355–375.

United States

ANALYSIS.—Analysis of mixtures of similar organic compounds. F. H. Rhodes, F. T. Gardner and A. W. Lewis. *Ind. Eng. Chem.*, January 1, pp. 85–86.

The estimation of nitrogen in petroleum and bitumens. E. J. Poth, W. D. Armstrong, C. C. Cogburn and J. R. Bailey. *Ind. Eng. Chem.*, January 1, pp. 83–85.

APPARATUS AND PLANT.—A small high-pressure autoclave. F. N. Peters, Jnr., and O. C. Stanger. *Ind. Eng. Chem.*, January 1, pp. 74–76.

Apparatus for storing and circulating gases. A. H. White and F. W. Hightower. *Ind. Eng. Chem.*, January 1, pp. 95–97.

An inexpensive cell for the purification of colloids by electrodialysis. R. Bradfield. *Ind. Eng. Chem.*, January 1, pp. 79–80.

Application of the interference refractometer to the measurement of the concentration of dilute solutions. R. Macey. *J. Amer. Chem. Soc.*, December, pp. 3070–3076.

GENERAL.—Destructive distillation of wood and cellulose under pressure. P. K. Frolich, H. B. Spalding and T. S. Bacon. *Ind. Eng. Chem.*, January 1, pp. 36–40.

Present status of coal by-product nitrogen. M. S. Sherman. *Ind. Eng. Chem.*, January 1, pp. 80–81.

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ANALYSIS.—Vanillin and piperonal as reagents for alkaloids. L. van Italie and A. J. Steenhauer. *Archiv der Pharmazie*, December, pp. 696–698.

The determination of gases dissolved in water. H. Richter. *Chemiker-Zeitung*, January 14, p. 47.

The application of the quinhydrone electrode to the electrometric titration of acids. A. Klit. *Z. physikalische Chem.*, Vol. 131, Parts 1–2, pp. 61–80.

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GENERAL.—The liquefaction relations of some gases. R. Nitzschmann. *Die Metallbörse*, January 11, pp. 64–65.

The use of compressed chlorine in practice. R. Freund. *Chemiker-Zeitung*, January 11, pp. 33–34.

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On iridium fluorides. O. Ruff and J. Fischer. *Z. Elektrochemie*, December, pp. 560–561.

ORGANIC.—Catalytic hydrogenation under pressure in the presence of nickel salts. XII. Alkylated anthraquinones. J. von Braun, O. Bayer and L. F. Fieser. *Annalen der Chem.*, Vol. 459, Parts 2–3, December 29, pp. 287–304.

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ADSORPTION.—Researches on selective adsorption. M. Geloso and L. S. Levy. *Comptes Rendus*, January 3, pp. 35–37 (in French).

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DYESTUFFS.—The centenary of the discovery of alizarin. A. Wahl. *Chimie et Industrie*, December, pp. 967–983 (in French).

GENERAL.—Eau de Javel and bleaching powder. B. Bleaching powder. J. H. Frydlender. *Rev. Produits Chimiques*, December 31, pp. 921–927 (in French).

The precipitation of iridium from its solutions by hydrogen under pressure. W. Ipatief and J. Andreewski. *Bull. Soc. Chimique de France*, November, pp. 1466–1467 (in French).

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Contribution to the determination of the value of artificial horn with a casein base. J. Obrist and O. Manfred. *Revue Matières Plastiques*, December, pp. 755–762 (in French).

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The transformation of alcohols into petroleum spirit. A. Mailhe and Renaudie. *Comptes Rendus*, December 27, pp. 1598–1600 (in French).

ORGANIC.—On some side-chain derivatives of cyclopentane : Tertiary alcohols, ethylenic and saturated hydrocarbons. G. Chavanne and P. Becker. *Bull. Soc. Chim. de Belgique*, December, pp. 591–604 (in French).

Sulphur-containing derivatives of *p*-dichlorobenzene. E. Gebauer-Füllneg and H. Figdor. *Monatshefte für Chemie*, Vol. 48, Part 8, December 22, pp. 627–638 (in German).

Investigations on perylene and its derivatives. XV. A. Pongratz. *Monatshefte für Chemie*, Vol. 48, Part 8, pp. 639–643 (in German).

The tautomerism of *o*-nitrobenzaldehyde. Preliminary note. J. Tanasescu. *Bull. Soc. Chimique de France*, November, pp. 1497–1499 (in French).

The synthetic manufacture of alcohol and acetic acid. P. Pascal. *Revue Matières Plastiques*, October, pp. 609–617 ; December, pp. 745–755 (in French).

Patent Literature

The following information is prepared from published Patent Specifications and from the Illustrated Official Journal (Patents) by permission of the Controller to H.M. Stationery Office. Printed copies of full Patent Specifications accepted may be obtained from the Patent Office, 25, Southampton Buildings, London, W.C.2, at 1s. each.

Abstracts of Complete Specifications

282,168. Controlling Chemical Reactions, Apparatus for. H. S. Hatfield, 35, Mapil Street, London, W.1, and United Water Softeners, Ltd., Aldwych House, Aldwych, W.C.2. Application date, September 18, 1926.

This apparatus is for controlling the amount of reagent added to a liquid with which it reacts. An analysing or testing apparatus is employed of the type described in Specification No. 264,237 (see The Chemical Age, Vol. XVI, p. 188), and the results of the tests carried out by this apparatus automatically control the amount of the reagent added to the liquid. A full description is given of the application of the invention to the control of the amount of the softening agent to be added to water in accordance with the indications of the analysing apparatus.

282,302. Purifying the Reagents Used in Preparing Per Salts and other Per Compounds, Process of Henkel and Cie., G.m.b.H., 67, Heyestrasse, Düsseldorf-Holthausen, Germany. International Convention date, December 24, 1926.

In the manufacture of per salts and other per compounds—*e.g.*, per borates and percarbonates—it is necessary that the chemicals used—*e.g.*, borax, caustic soda and calcined soda—must be particularly pure owing to the catalytic decomposing effect of very small quantities of impurities. Similarly, the sulphuric acid, water, etc., employed in the manufacture of hydrogen peroxide must be very pure to obtain a durable product. It has been found that the yield of oxygen and the durability are unfavourably affected by minute quantities of heavy metals which may be normally contained in the water, chiefly manganese, copper and very small traces of platinum. It has been found that these impurities can be eliminated by treating the solutions with silica gel which has the property of absorbing these impurities. The solution may be boiled with the silica gel, or it may be treated at ordinary temperature but for a longer time. The silica gel may be regenerated by washing, treating with acid, and heating.

282,306. Recovering Lead or Lead Compounds, from Lead-Sulphur Compounds, Process of. A. L. Mond, London. From Norddeutsche Chemische Fabrik in Harburg, Harburg (Elbe), Germany. Application date, August 8, 1927.

The object is to recover lead compounds from materials containing lead sulphide or sulphate. A material containing lead sulphate is treated with a concentrated solution of sodium chloride at an increased pressure and a temperature above 100° C. Thus commercial lead sulphate may be freed from soluble salts, free acid, etc., and agitated with an equivalent quantity of 25 per cent. solution of sodium chloride at a pressure of 4–5 atmospheres and temperature of 140°–150° C. The mixture is allowed to settle and filtered through a heated filter press. The solution may be cooled to crystallise lead chloride. If the raw material contains lead in other forms such as sulphide, lead sulphate is first produced and then treated as above. Lead or any other lead compound may be obtained from the lead chloride.

282,508. Oxidation of Hydrogen Sulphide contained in Industrial Gases to Sulphur, Process for. W. Carpmael, London. From I.G. Farbenindustrie Akt.-Ges., Frankfort-on-Main, Germany. Application date, September 27, 1926.

In the treatment of gases containing hydrogen sulphide and air with active carbon, it has been found that the progress of the reaction varies within wide limits with gases having the same proportion of hydrogen sulphide, so that in some cases the gas can be purified from hydrogen sulphide by a layer of carbon a few centimetres thick, while in other cases a layer some metres thick is necessary. It has been found that the reaction is greatly affected by the humidity of the gas, the most favourable position being a humidity of 80 per cent. or more. The humidity is therefore increased to the required amount by the addition of water vapour by spraying, etc., or the active carbon may be moistened. The temperature of the reaction vaporises the water and is thereby itself reduced.

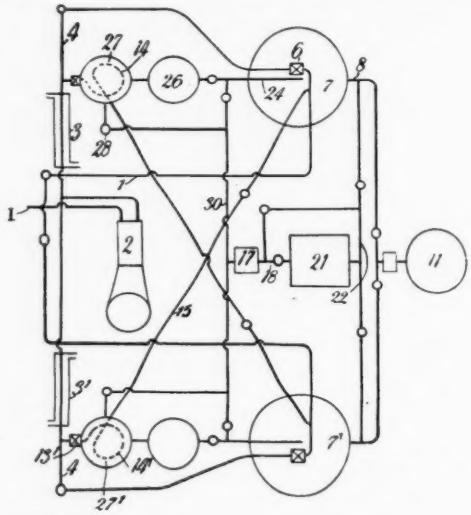
In an example, illuminating gas containing 10 grams of hydrogen sulphide per cubic metre is passed at a velocity of 5 centimetres per second through a layer of active carbon one metre thick maintained at a temperature of 20° C., the humidity being above 80 per cent. Hydrogen sulphide is absorbed until the carbon has absorbed 90 per cent. of its weight of sulphur.

282,525. Distillation of Tar and other Viscous Substances, Apparatus for. J. F. Carmichael, and J. F. Carmichael and Co., Ltd., 729, Tower Building, Water Street, Liverpool. Application date, October 28, 1926.

The tar is sprayed on to an annular pipe coil through which steam or hot gas is passed. Tar passes downwards in the form of a thin film over the pipe coil, and water and other light volatile substances are thus distilled off. The heating fluid may enter the pipe coil at the lower end and pass upward in counter-current to the tar.

282,541. Obtaining Volatile Hydrocarbons such as Gasoline, Benzene, etc., from Natural Gas, Coal Gas, Water Gas, etc. M. Okochi, 1, Shimizu-cho, Yanaka, Shitaya-ku, Tokyo, Japan. Application date, November 12, 1926.

Gas from a pipe 1 passes through a compressor 2, water cooler 3, pipe 4, and expansion valve 6, to an adsorbing tower 7 containing fuller's earth, silica gel, or charcoal. Gasoline,



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water, etc., are adsorbed, and the residual gas, *e.g.*, methane, passes through a pipe 8 to a storage reservoir 11. Part of the gas from the pipe 1 passes through the pipe 1 around the expansion valve 6 to the tower 7, where it is mixed with the low-temperature expanded gas to adjust its temperature. Part of the gas from the compressor 2 passes through water cooler 3′ and expansion valve 13′ to a coil 14′ in a cooler 27′, and thence through the pipe 15 to the tower 7. When the tower 7 is saturated, the valves in the above-mentioned pipes are closed and a fan 17 draws gas through pipe 30 and forces it through pipe 18 to a heater 21, from which it passes through pipe 22 to the tower to heat it. The gas passing out through pipe 24 passes partly into pipe 30, and partly to a water cooler 26 and a low temperature cooler 27 and valves 28 back to the fan 17. The coil 14 is connected to the tower 7′, which is used for the adsorption alternately with the tower 7. The gas in the coil 14 is cooled to a low

temperature by sudden expansion and by the adsorption which takes place in the tower 7'. The tower 7 may be cooled by continuing the circulation above described, but excluding the heater 21. The tower 7 is then ready for the next adsorption and the cycle is repeated. The process can be applied to the recovery of benzene or naphthalene from coal gas.

NOTE.—Abstracts of the following specifications which are now accepted, appeared in THE CHEMICAL AGE when they became open to inspection under the International Convention :—258,894 (I. G. Farbenindustrie Akt.-Ges.), relating to azo dyestuffs, see Vol. XV, p. 528 ; 271,103 (Consortium für Elektro-Chemische Industrie Ges.), relating to butyric aldehyde, see Vol. XVII, p. 62 ; 275,578 (Titan Co. Aktieselskabet), relating to solution of titaniferous materials in acids, see Vol. XVII, p. 331.

International Specifications not yet Accepted

280,574. AMINO-ALCOHOLS. W., K., L., W., and F. Merck, Darmstadt, Germany. International Convention date, November 10, 1926.

Arylamino-alkylketones are hydrogenated to the corresponding carbinols in the presence of a nickel catalyst on a support such as pumice. Examples are given of the production of phenyl-N-methylaminomethyl-carbinol from N-methylamino-acetophenone, phenylamino-methylcarbinol from aminoacetophenone, phenyl-N-methylaminoethyl-carbinol from N-methylamino-propiophenone, and racemic adrenaline from ω-methylamino-aceto-pyrocatechin.

280,595. DYES. Soc. of Chemical Industrie in Basle, Switzerland. International Convention date, November 13, 1926. Addition to 0199, 360 and 270,348. (See THE CHEMICAL AGE, Vol. IX, p. 211, and Vol. XVII, p. 39.)

Specification 270,348 describes the production of sulphuretted dyes by sulphuretting in the presence of an aromatic base and urea the indophenols from carbazole or N-alkylcarbazol and a nitrosophenol or leuco derivatives thereof. In this invention, the aromatic base is omitted, and the urea is replaced by other nitrogen compounds such as semi-carbazide guanidine, dicyandiamide, thiourea, ammonium sulphocyanide, and acetamide.

280,846. DYES. I.G. Farbenindustrie Akt.-Ges., Frankfort-on-Main, Germany. International Convention date, November 18, 1926.

An aminobenzanthrone is diazotised by means of nitrogen oxides in concentrated sulphuric acid, and the product treated with alkali xanthates or sulphur-containing compounds having a similar action. The product is freed from resinous constituents by extraction with acetone, and then fused with caustic potash and alcohol at 280° C. A black dyestuff is obtained.

280,877. AMINES. Silesia Verein Chemischer Fabriken, Ida-und Marienhütte, near Saarau, Germany. International Convention date, November 19, 1926.

A mixture of mono- and di-methylaniline is dissolved in benzene, and phthalic anhydride added to convert the monomethylaniline into phthalaminic acid, which is separated by means of dilute caustic soda and split up into phthalic acid and monomethylaniline. The dimethylaniline remains in the benzene.

280,885. SEPARATING ACETYLENE FROM OTHER GASES. I.G. Farbenindustrie Akt.-Ges., Frankfort-on-Main, Germany. International Convention date, November 16, 1926.

Acetylene in a gaseous mixture is almost completely dissolved when shaken with water at 5-25 atmospheres pressure, but methane and hydrogen are only slightly dissolved. On partly releasing the pressure the latter are evolved, and on further releasing the pressure a gas rich in acetylene is obtained.

280,886. DYES. I.G. Farbenindustrie Akt.-Ges., Frankfort-on-Main, Germany. International Convention date, November 18, 1926.

Benzanthronyl-1-aminoanthraquinones alkylated at the nitrogen atom are treated with alkaline agents to obtain vat dyes. N-methyl-benzanthronyl-1-aminoanthraquinones are obtained by alkylating benzanthronyl-1-amino-anthraquinones and an example is given of the production of a dye giving blue-green shades on cotton by treating N-methyl-Bz1-benzanthronyl-1-aminoanthraquinone with alcoholic caustic potash at 98° C.

280,924. HYDROGENATION OF PHENOL-KETONE CONDENSATION PRODUCTS. Schering-Kahlbaum Akt.-Ges. (formerly Chemische Fabrik auf Actien vorm. E. Schering), 170, Müllerstrasse, Berlin. International Convention date, November 16, 1926. Addition to 276,010.

The process described in Specification 276,010 (See THE CHEMICAL AGE, Vol. XVII, p. 373) is conducted at higher temperatures. Thymol and stereoisomeric menthols are obtained by treating the condensation product of *m*-cresol and acetone with hydrogen under pressure in the presence of a nickel catalyst at 280° C. The product from *p*-cresol and acetone yields 4-methyl-6-isopropylphenol and then the stereoisomeric 4-methyl-6-isopropylcyclohexanols.

280,939. CATALYTIC GELS. Silica Gel-Corporation, 239, Redwood Street, Baltimore, Md., U.S.A. (Assignees of E. B. Miller and G. C. Connolly, 239, Redwood Street, Baltimore, Md., U.S.A.) International Convention date, November 19, 1926.

A hydrogel is treated with a solution of a metallic salt which yields a catalyst on decomposition by heat, and water is removed from the hydrogel, which is then heated. The gel may be silica, alumina, tungstic oxide, stannic oxide, &c., and the impregnating agent may be a salt of copper, iron, aluminium, manganese, nickel, silver, platinum, &c.

280,945. DIAZO COMPOUNDS. Soc. of Chemical Industry in Basle, Switzerland. International Convention date, November 18, 1926. Addition to 238,704.

Specification 238,704 (See THE CHEMICAL AGE, Vol. XIII, p. 332) describes the production of diazo preparations from naphthalene trisulphonic acid, and this process is now extended to diazo compounds in general, except those derived from aminoazo compounds. The diazo solutions are evaporated with a neutral naphthalene trisulphonate with or without a diluent or fixing agent, such as salt, sodium sulphate or aluminium sulphate. Examples are given.

280,947. REMOVING SULPHUR COMPOUNDS FROM GASES. Silica Gel Corporation, 239, Redwood Street, Baltimore, Md., U.S.A. (Assignees of E. B. Miller and G. C. Connolly, 239, Redwood Street, Baltimore, Md., U.S.A.) International Convention date, November 19, 1926.

Sulphur compounds are removed from coke oven, water, or producer gas by treating with air in presence of a highly porous silica gel impregnated with 1% of ferric or cupric oxide. The adsorbent may be in suspension in the gas, or the gas may be passed through two layers of adsorbent heated to 200°-210° C. and 185°-200° C. respectively. Organic sulphur compounds are converted into hydrogen sulphide by a preliminary treatment at 450° C.

280,956. HYDROGENATION OF PHENOL-KETONE CONDENSATION PRODUCTS. Schering-Kahlbaum Akt.-Ges. (formerly Chemische Fabrik auf Actien, vorm. E. Schering), 170, Müllerstrasse, Berlin. International Convention date, November 22, 1926. Addition to 276,010. (See THE CHEMICAL AGE, Vol. XVII, p. 373.)

The etheric condensation products of an alkylated phenol with a ketone are hydrogenated at higher temperatures than usual until 4 or 16 hydrogen atoms are taken up. Thus, the etheric condensation product of *m*-cresol and acetone is hydrogenated at 250°-280° C., yielding thymol and then stereoisomeric menthols, and the product of *p*-cresol and acetone yields 4-methyl-6-isopropylphenol and then a mixture of the stereoisomeric 4-methyl-2-isopropylcyclohexanols.

281,227. HYDROXY-BENZOYLBENZOIC ACID. Newport Co., Carrollville, Wis., U.S.A. (Assignees of I. Gubelmann, 1202, Fairview Avenue, South Milwaukee, H. J. Weiland, 1251, Fairview Avenue, South Milwaukee, and O. Stallmann, 402, North Chicago Avenue, South Milwaukee, Wis., U.S.A.) International Convention date, November 29, 1926.

Crude *p*-chloro-*o*-benzoylbenzoic acid is heated with caustic soda solution under pressure to obtain *p*-hydroxy-*o*-benzoylbenzoic acid.

LATEST NOTIFICATIONS.

283,517. Process for the prevention of boiler incrustations. Lazarus, W. January 12, 1927.

283,569. Process for the removal of phenols from tars or tar oils. Karpati, Dr. J., and Hübsch, Dr. M. G. January 15, 1927.

283,493. Manufacture of solutions of the active principle of organs or glands with internal secretion. I.G. Farbenindustrie Akt.-Ges. January 11, 1927.

283,545. Recovery of valuable organic products. I.G. Farbenindustrie Akt.-Ges. January 13, 1927.

283,576. Process for the manufacture of 2-aminopyridines substituted in the 5-position by iodine. Schering-Kahlbaum Akt.-Ges. January 14, 1927.

283,577. Process for the manufacture of 4-alkyl-quinolines and derivatives thereof. Schering-Kahlbaum Akt.-Ges. January 14, 1927.

283,510. Manufacture of basic nitro-derivatives of ms-aminoacridine. I.G. Farbenindustrie Akt.-Ges. January 11, 1927.

283,595. Manufacture of mixed esters of cellulose and of conversion products thereof. I.G. Farbenindustrie Akt.-Ges. January 15, 1927.

283,840. Manufacture of synthetic rubber. I.G. Farbenindustrie Akt.-Ges. January 14, 1927.

283,841. Manufacture of synthetic rubber. I.G. Farbenindustrie Akt.-Ges. January 15, 1927.

283,864. Process for the production and use of cleaning, emulsifying and wetting agents. Oranienburger Chemische Fabrik Akt.-Ges. January 17, 1927.

Specifications Accepted with Date of Application

256,964 and 257,256. Valuable liquid and other hydrocarbons and derivatives thereof—manufacture and production of—by the destructive hydrogenation of mineral coal and other solid carbonaceous materials. I.G. Farbenindustrie Akt.-Ges. August 14 and August 20, 1925.

258,576. Crude benzol, Purification of. I.G. Farbenindustrie Akt.-Ges. September 15, 1925.

259,944. Motor fuels, Manufacture and production of. I.G. Farbenindustrie Akt.-Ges. October 19, 1925.

263,816. Monoazo dyestuffs capable of being chromed, Manufacture of. I.G. Farbenindustrie Akt.-Ges. December 23, 1925.

266,697. Tanning agents, Manufacture of. I.G. Farbenindustrie Akt.-Ges. February 23, 1926.

267,547. Titanium ores, Process for treating. I.G. Farbenindustrie Akt.-Ges. March 11, 1926.

268,716. Iron and steel or iron alloys and steel alloys, Method of making. F. Krupp Akt.-Ges. April 3, 1926.

271,482. Synthetic ammonia, Process for the production of. K. Muller. May 19, 1926.

272,155. Formaldehyde, Process for the manufacture of. Soc. Chimique de la Grande-Paroisse, Azote et Produits Chimiques. June 3, 1926.

272,522 and 282,340. Distillation of solid fuels at low temperature, Process for. Compagnie des Mines de Bruay. June 14 and December 18, 1926.

273,666. Chromates, Process for the production of. A. L. Mond. (*I.G. Farbenindustrie Akt.-Ges.*) June 30, 1927.

276,353. Azo-dyestuffs, Manufacture of. I.G. Farbenindustrie Akt.-Ges. August 19, 1926.

275,147. Dyestuffs, Manufacture of. Fabrique de Produits Chimiques Rohner Soc. Anon. Pratteln. August 2, 1926.

278,370. Extracting clay and other argillaceous raw materials with acids, Process of. I.G. Farbenindustrie Akt.-Ges. September 29, 1926.

283,259. Distillation of carbonaceous materials. W. E. Evans. (*Carlshütte Akt.-Ges. fur Eisengiesserei und Maschinenbau.*) October 2, 1926.

283,267. Activation of carbon and the production of carbon bisulphide, Process for. K. Carpmael and K. S. Carpmael. (*I.G. Farbenindustrie Akt.-Ges.*). October 5, 1926.

283,269. Liquid products from coal, Process for recovering. H. Novak and A. Brod. October 5, 1926.

283,383. Refining Oil, Method and apparatus for. E. C. R. Marks. (*Simplex Refining Co.*). April 20, 1927.

283,087. Leucite and like minerals, Treatment of. P. S. Spence & Sons, Ltd., and T. J. I. Craig. June 29, 1926.

283,232. Fixation of atmospheric nitrogen. J. Brightmore. July 6, 1926.

Applications for Patents

American Cyanamid Co. Fertilisers. 1,497. January 16. (United States, January 28, 1927.)

Bakelite, Ltd., and Crump, J. W. Manufacture of resinous condensation products of aldehydes, etc. 1,476. January 16.

Barnes, R. S., Harris, J. E. G., Scottish Dyes, Ltd., Thomas, J., and Wylam, B. Production of dyestuffs. 1,487. January 16.

Barnes, R. S., Harris, J. E. G., Scottish Dyes, Ltd., Thomas, J., and Wylam, B. Dyestuff intermediates. 1,606. January 17.

Berl, E. Manufacture of activated carbon. 1,955. January 20. (Germany, January 21, 1927.)

Burn, J. F. Means for supplying liquid to drums of mixing-machines. 1,592. January 17.

Carpmael, A., and I.G. Farbenindustrie Akt.-Ges. Manufacture of condensation products of benzodiazine series. 1,442. January 16.

Carpmael, A., and I.G. Farbenindustrie Akt.-Ges. Manufacture of aromatic polyhydroxy compounds. 1,725. January 18.

Chemical Engineering and Wilton's Patent Furnace Co., Ltd., Wilton, N., and Wilton, T. O. Manufacture of sulphate of ammonia. 2,064. January 21.

Classen, A. Process for removing hydrochloric acid from sugar solutions, etc. 1,614. January 17.

I.G. Farbenindustrie Akt.-Ges. and Johnson, J. Y. Production of tanning agents. 690. January 9.

I.G. Farbenindustrie Akt.-Ges. and Mond, A. L. Rendering insoluble substances soluble. 958. January 11.

I.G. Farbenindustrie Akt.-Ges. and Imray, O. Y. Manufacture of printing-colours. 940. January 11.

I.G. Farbenindustrie Akt.-Ges. and Johnson, J. Y. Production of acetone. 993. January 11.

I.G. Farbenindustrie Akt.-Ges. and Johnson, J. Y. Manufacture of dyestuffs containing chromium. 994, 995. January 11.

I.G. Farbenindustrie Akt.-Ges. and Johnson, J. Y. Production of acetic acid, etc. 1,097. January 12.

I.G. Farbenindustrie Akt.-Ges. and Johnson, J. Y. Production of compounds resembling cellulose. 1,098. January 12.

I.G. Farbenindustrie Akt.-Ges. and Johnson J. Y. Production of phosphoric esters of aliphatic alcohols. 1,099. January 12.

I.G. Farbenindustrie Akt.-Ges. and Johnson, J. Y. Production of sulphonated products. 1,208. January 13.

I.G. Farbenindustrie Akt.-Ges. and Johnson, J. Y. Desulphurisation of organic substances. 1,328. January 14.

I.G. Farbenindustrie Akt.-Ges. and Johnson, J. Y. Pest-destroying agents. 1,329. January 14.

I.G. Farbenindustrie Akt.-Ges. and Johnson, J. Y. Driers for varnishes, etc. 1,330. January 14.

I.G. Farbenindustrie Akt.-Ges. Activation of carbon. 691. January 9. (Germany, January 10, 1927.)

I.G. Farbenindustrie Akt.-Ges. Manufacture of acid-proof cements, etc. 723. January 9. (Germany, January 8, 1927.)

I.G. Farbenindustrie Akt.-Ges. Manufacture of basic nitro-derivatives of ms-aminoacridine. 999. January 11. (Germany, January 11, 1927.)

I.G. Farbenindustrie Akt.-Ges. Manufacture of esters of cellulose, etc. 1,347. January 14. (Germany, January 15, 1927.)

I.G. Farbenindustrie Akt.-Ges. and Johnson J. Y. Production of nitric acid, etc. 1,421. January 16.

I.G. Farbenindustrie Akt.-Ges. and Johnson, J. Y. Treatment of gases, etc. 1,694. January 18.

I.G. Farbenindustrie Akt.-Ges. and Johnson, J. Y. Reduction products of vat dyestuffs. 2,046. January 21.

I.G. Farbenindustrie Akt.-Ges. Process for developing photographic films. 1,435. January 16. (Germany, March 25, 1927.)

I.G. Farbenindustrie Akt.-Ges. Manufacture of synthetic rubber. 1,445. January 16. (Germany, January 14, 1927.)

I.G. Farbenindustrie Akt.-Ges. Manufacture of synthetic rubber. 1,446. January 16. (Germany, January 15, 1927.)

I.G. Farbenindustrie Akt.-Ges. Boilers with heating, etc., apparatus. 1,601. January 17. (Germany, January 27, 1927.)

I.G. Farbenindustrie Akt.-Ges. Manufacture of azo dyestuffs. 1,616. January 17. (Germany, January 19, 1927.)

I.G. Farbenindustrie Akt.-Ges. Process of halogenating organic compounds. 1,692. January 18. (Germany, January 18, 1927.)

I.G. Farbenindustrie Akt.-Ges. Manufacture of acid-proof linings for vessels. 1,923. January 20. (Germany, January 22, 1927.)

Imperial Chemical Industries, Ltd. Regeneration of catalysts. 1,524. January 17.

Imperial Chemical Industries, Ltd. Transformation of gaseous hydrocarbons. 1,985. January 21.

Merck, E. [Firm of], F., K., L., and W. Separation of 1-phenyl-2-methylaminopropanol-1. 1,137. January 12. (Germany, February 2, 1927.)

Parkinson, T. Dyeing-apparatus, etc. 1,172. January 13.

Pochin, H. S., and Cheltnam, C. H. W. Separating solid impurities from air, etc. 1,895. January 20.

Robson, S. Production of sulphuric anhydride. 776. January 10.

Rowell, S. W. Regeneration of catalysts. 1,524. January 17.

Soc. Anon. des Distilleries des Deux Sèvres. Manufacture of acetic acid. 1,213. January 13. (France, September 10, 1927.)

Soc. Chimique des Usines du Rhone. Manufacture of artificial silk. 1,222. January 13. (France, July 29, 1927.)

Vidal, R. Process for preparing sulphur dyes, etc. 694. January 9. (France, January 8, 1927.)

Vidal, R. Preparation of black colour materials. 695. January 9. (France, January 8, 1927.)

Wack, J. J. Clarification of benzine. 1,255. January 13.

Weekly Prices of British Chemical Products

The prices and comments given below respecting British chemical products are based on direct information supplied by the British manufacturers concerned. Unless otherwise qualified, the figures quoted apply to fair quantities, net and naked at makers' works.

General Heavy Chemicals

ACID ACETIC, 40% TECH.—£19 per ton.

ACID BORIC, COMMERCIAL.—Crystal, £30 per ton; powder, £32 per ton; extra fine powder, £34 per ton.

ACID HYDROCHLORIC.—3s. 9d. to 6s. per carboy d/d, according to purity strength, and locality.

ACID NITRIC, 80° TW.—£21 10s. to £27 per ton, makers' works, according to district and quality.

ACID SULPHURIC.—Average National prices f.o.r. makers' works, with slight variations up and down owing to local considerations; 140° Tw., Crude Acid, 60s. per ton. 168° Tw., Arsenical, £5 10s. per ton. 168° Tw., Non-arsenical, £6 15s. per ton.

AMMONIA ALKALI.—£6 15s. per ton f.o.r. Special terms for contracts.

BISULPHITE OF LIME.—£7 10s. per ton, f.o.r. London, packages extra.

BLEACHING POWDER.—Spot, £9 10s. per ton d/d; Contract, £8 10s. per ton d/d, 4-ton lots.

BORAX, COMMERCIAL.—Crystals, £19 10s. to £20 per ton; granulated, £19 per ton; powder, £21 per ton. (Packed in 2-cwt. bags, carriage paid any station in Great Britain.)

CALCIUM CHLORIDE (SOLID).—£5 to £5 5s. per ton d/d carr. paid.

COPPER SULPHATE.—£25 to £25 10s. per ton.

METHYLATED SPIRIT 61 O.P.—Industrial, 2s. 2d. to 2s. 7d. per gall.; pyridinised industrial, 2s. 4d. to 2s. 9d. per gall.; mineralised, 3s. 3d. to 3s. 7d. per gall.; 64 O.P., 1d. extra in all cases; prices according to quantity as from January 1, 1928.

NICKEL SULPHATE.—£38 per ton d/d.

NICKEL AMMONIA SULPHATE.—£38 per ton d/d.

POTASH CAUSTIC.—£30 to £33 per ton.

POTASSIUM BICHROMATE.—4½d. per lb.

POTASSIUM CHLORATE.—3¾d. per lb., ex wharf, London, in cwt. kegs.

SALAMMONIAC.—£45 to £50 per ton d/d. Chloride of ammonia £37 to £45 per ton, carr. paid.

SALT CAKE.—£3 15s. to £4 per ton d/d. In bulk.

SODA CAUSTIC, SOLID.—Spot lots delivered, £15 2s. 6d. to £18 per ton, according to strength; 20s. less for contracts.

SODA CRYSTALS.—£5 to £5 5s. per ton, ex railway depots or ports.

SODIUM ACETATE 97/98%.—£21 per ton.

SODIUM BICARBONATE.—£10 10s. per ton, carr. paid.

SODIUM BICHROMATE.—3½d. per lb.

SODIUM BISULPHITE POWDER, 60/62%.—£17 10s. per ton delivered for home market, 1-cwt. drums included; £15 10s. f.o.r. London.

SODIUM CHLORATE.—2¾d. per lb.

SODIUM NITRITE, 100% BASIS.—£27 per ton d/d.

SODIUM PHOSPHATE.—£14 per ton, f.o.b. London, casks free.

SODIUM SULPHATE (GLAUBER SALTS).—£3 12s. 6d. per ton.

SODIUM SULPHIDE CONC. SOLID, 60/65.—£13 5s. per ton d/d. Contract, £13. Carr. paid.

SODIUM SULPHIDE CRYSTALS.—Spot, £8 12s. 6d. per ton d/d. Contract, £8 10s. Carr. paid.

SODIUM SULPHITE, PEA CRYSTALS.—£14 per ton f.o.b. London, 1-cwt. kegs included.

Coal Tar Products

ACID CARBOLIC CRYSTALS.—7¼d. to 7¾d. per lb. Crude 60's, 2s. 5d. per gall. prompt; lower for forward delivery.

ACID CRESYLIC 99/100.—2s. 11d. to 3s. per gall. 97/99.— 2s. 7d. to 2s. 10d. per gall. Pale, 95%, 2s. 3d. to 2s. 4d. per gall. Dark, 95%, 2s. 1d. to 2s. 2d.

ANTHRACENE.—A quality, 2½d. per unit. 40%, £5 per ton.

ANTHRACENE OIL, STRAINED.—8d. to 8½d. per gall. Unstrained, 7¾d. to 8d. per gall.

BENZOLE.—Crude 65's, 9¼d. to 9¾d. per gall., ex works in tank wagons. Standard Motor, 1s. 1¼d. to 1s. 2¼d. per gall., ex works in tank wagons. Pure, 1s. 5d. to 1s. 6d. per gall., ex works in tank wagons.

TOLUOLE.—90%, 1s. 4d. to 1s. 8d. per gall. Firm. Pure, 1s. 6d. to 1s. 11d. per gall.

XYLOL.—1s. 3d. to 1s. 8d. per gall. Pure, 1s. 9d. per gall.

CREOSOTE.—Cresylic, 20/24%, 10d. to 11d. per gall.; middle oil, 8d. to 9d. per gall. Heavy, 8¾d. to 9d. per gall. Standard specification, 7½d. to 7¾d. ex works. Salty, 7d. per gall., less 1¼%.

NAPHTHA.—Crude, 9d. to 10d. per gall. Solvent 90/160, 1s. to 1s. 1d. per gall. Solvent 95/160, 1s. 3d. to 1s. 4d. per gall. Solvent 90/190, 10d. to 1s. 2d. per gall.

NAPHTHALENE CRUDE.—Drained Creosote Salts, £5 per ton. Whizzed or hot pressed, £8 per ton.

NAPHTHALENE.—Crystals, £13 to £13 10s. per ton. Quiet. Flaked, £14 to £15 per ton, according to districts.

PITCH.—Medium soft, 75s. to 85s. per ton, f.o.b., according to district. Nominal.

PYRIDINE.—90/140, 5s. 6d. to 6s. 6d. per gall. 90/180, 3s. 6d. to 5s. per gall. Heavy, 3s. to 3s. 6d. per gall.

Intermediates and Dyes

In the following list of Intermediates delivered prices include packages except where otherwise stated:

ACID AMIDONAPHTHOL DISULPHO (1-8-2-4).—10s. 9d. per lb.

ACID ANTHRANILIC.—6s. per lb. 100%.

ACID BENZOIC.—1s. 8½d. per lb.

ACID GAMMA.—4s. 6d. per lb.

ACID H.—3s. per lb.

ACID NAPHTHIONIC.—1s. 6d. per lb.

ACID NEVILLE AND WINTHER.—4s. 9d. per lb.

ACID SULPHANILIC.—8½d. per lb.

ANILINE OIL.—8d. per lb. naked at works.

ANILINE SALTS.—8d. per lb. naked at works.

BENZALDEHYDE.—2s. 3d. per lb.

BENZIDINE BASE.—3s. 3d. per lb. 100% basis d/d.

BENZOIC ACID.—1s. 8½d. per lb.

o-CRESOL 29/31° C.—5½d. per lb.

m-CRESOL 98/100%.—2s. 3d. to 2s. 5d. per lb.

p-CRESOL 32/34° C.—2s. 3d. to 2s. 5d. per lb.

DICHLORANILINE.—1s. 10d. per lb.

DIMETHYLANILINE.—1s. 11d. per lb.

DINITROBENZENE.—8½d. per lb. naked at works. £75 per ton.

DINITROCHLORBENZENE.—£84 per ton d/d.

DINITROTOLUENE.—48/50° C. 8d. per lb. naked at works. 66/68° C. 9d. per lb. naked at works.

DIPHENYLAMINE.—2s. 10d. per lb. d/d.

a-NAPHTHOL.—2s. per lb. d/d.

B-NAPHTHOL.—10d. per lb. d/d.

a-NAPHTHYLAMINE.—1s. 3d. per lb.

B-NAPHTHYLAMINE.—3s. per lb.

o-NITRANILINE.—5s. 9d. per lb.

m-NITRANILINE.—3s. per lb. d/d.

p-NITRANILINE.—1s. 8d. per lb.

NITROBENZENE.—6d. per lb. naked at works.

NITRONAPHTHALENE.—1s. 3d. per lb.

R. SALT.—2s. 2d. per lb.

SODIUM NAPHTHIONATE.—1s. 8½d. per lb. 100% basis d/d.

o-TOLUIDINE.—8½d. per lb.

p-TOLUIDINE.—2s. per lb. naked at works.

m-XYLIDINE ACETATE.—2s. 6d. per lb. 100%.

N. W. ACID.—4s. 9d. per lb. 100%.

Wood Distillation Products

ACETATE OF LIME.—Brown, £10 5s. per ton. Good demand. Grey, £14 10s. to £15 per ton. Liquor, 9d. per gall.

CHARCOAL.—£6 to £9 per ton, according to grade and locality. Foreign competition severe.

IRON LIQUOR.—1s. 3d. per gall, 32° Tw. 1s. per gall. 24° Tw.

RED LIQUOR.—9d. to 10d. per gall.

WOOD CREOSOTE.—1s. 9d. per gall. Unrefined.

WOOD NAPHTHA, MISCIBLE.—3s. 11d. to 4s. 3d. per gall. Solvent, 4s. 3d. per gall.

WOOD TAR.—£4 to £5 per ton.

BROWN SUGAR OF LEAD.—£40 15s. per ton.

Rubber Chemicals

ANTIMONY SULPHIDE.—Golden, 6½d. to 1s. 5½d. per lb., according to quality; Crimson, 1s. 4d. to 1s. 6d. per lb., according to quality.

ARSENIC SULPHIDE, YELLOW.—1s. 9d. per lb.

BARYTES.—£3 10s. to £6 15s. per ton, according to quality.

CADMIUM SULPHIDE.—2s. 6d. to 2s. 9d. per lb.

CARBON BISULPHIDE.—£20 to £25 per ton, according to quantity.

CARBON BLACK.—5½d. per lb., ex wharf.

CARBON TETRACHLORIDE.—£45 to £50 per ton, according to quantity, drums extra.

CHROMIUM OXIDE, GREEN.—1s. 1d. per lb.

DIPHENYLGUANIDINE.—3d. 9d. per lb.

INDIARUBBER SUBSTITUTES, WHITE AND DARK.—5¾d. to 6¼d. per lb.

LAMP BLACK.—£35 per ton, barrels free.

LEAD HYPOSULPHITE.—9d. per lb.

LITHOPHONE, 30%.—£22 10s. per ton.

MINERAL RUBBER "RUBPRON."—£13 12s. 6d. per ton, f.o.r. London.

SULPHUR.—£9 to £11 per ton, according to quality.

SULPHUR CHLORIDE.—4d. to 7d. per lb., carboys extra.

SULPHUR PRECIP. B.P.—£47 10s. to £50 per ton.

THIOCARBAMIDE.—2s. 6d. to 2s. 9d. per lb., carriage paid.

THIOCARBANILIDE.—2s. 1d. to 2s. 3d. per lb.

VERMILION, PALE OR DEEP.—6s. to 6s. 3d. per lb.

ZINC SULPHIDE.—1s. per lb.

Pharmaceutical and Photographic Chemicals

ACID, ACETIC, PURE, 80%.—£39 per ton ex wharf London in glass containers.

ACID, ACETYL SALICYLIC.—2s. 5d. to 2s. 7d. per lb.

ACID, BENZOIC, B.P.—2s. to 3s. 3d. per lb., according to quantity. Solely ex Gum, 1s. to 1s. 3d. per oz., according to quantity.

ACID, BORIC B.P.—Crystal, 36s. to 39s. per cwt.; powder, 40s. to 43s. per cwt.; extra fine powder, 42s. per cwt., according to quantity. Carriage paid any station in Great Britain, in ton lots.

ACID, CAMPHORIC.—19s. to 21s. per lb.

ACID, CITRIC.—1s. 7¼d. to 1s. 8d. per lb., less 5%.

ACID, GALLIC.—2s. 8d. per lb. for pure crystal, in cwt. lots.

ACID, PYROGALLIC, CRYSTALS.—7s. 3d. per lb. Resublimed, 8s. 3d. per lb.

ACID, SALICYLIC, B.P. PULV.—1s. 2½d. to 1s. 3½d. per lb.; Technical.—11½d. to 11¾d. per lb.

ACID, TANNIC B.P.—2s. 8d. to 2s. 10d. per lb.

ACID, TARTARIC.—1s. 3½d. per lb., less 5%.

ACETANILIDE.—1s. 6d. to 1s. 9d. per lb. for quantities.

AMIDOL.—7s. 6d. to 9s. per lb., d/d.

AMIDOPYRIN.—8s. to 8s. 3d. per lb.

AMMONIUM BENZOATE.—3s. to 3s. 3d. per lb., according to quantity. 18s. per lb. ex Gum.

AMMONIUM CARBONATE B.P.—£37 per ton. Powder, £39 per ton in 5 cwt. casks. Resublimated, 1s. per lb.

ATROPINE SULPHATE.—9s. per oz.

BARBITONE.—5s. 9d. to 6s. per lb.

BENZONAPHTHOL.—3s. 3d. per lb. spot.

BISMUTH CARBONATE.—10s. 4d. to 10s. 7d. per lb.

BISMUTH CITRATE.—9s. 10d. to 10s. 1d. per lb.

BISMUTH SALICYLATE.—8s. 10d. to 10s. 1d. per lb.

BISMUTH SUBNITRATE.—8s. 4d. to 8s. 7d. per lb.

BISMUTH NITRATE.—6s. 1d. to 6s. 4d. per lb.

BISMUTH OXIDE.—13s. 10d. to 14s. 1d. per lb.

BISMUTH SUBCHLORIDE.—13s. 10d. to 14s. 1d. per lb.

BISMUTH SUBGALLATE.—8s. 1d. to 8s. 4d. per lb. Extra and reduced prices for smaller and larger quantities respectively; Liquor Bismuthi et Ammon. Cit. B.P. in W. Qts. 1s. 1d. per lb.; 12 W. Qts. 1s. per lb.; 36 W. Qts., 11½d. per lb.

BORAX B.P.—Crystal, 25s. per cwt.; powder, 26s. per cwt., according to quantity. Carriage paid any station in Great Britain, in ton lots.

BROMIDES.—Ammonium, 1s. 11d. to 2s. 1d. per lb.; potassium, 1s. 7¾d. to 1s. 9¾d. per lb.; sodium, 1s. 10d. to 2s. per lb.; granulated, ¼d. per lb. less; all spot. Large quantities at lower rates.

CALCIUM LACTATE.—1s. 2d. to 1s. 3d. per lb.

CAMPHOR.—Refined flowers, 2s. 11d. to 3s. 1d. per lb., according to quantity; also special contract prices.

CHLORAL HYDRATE.—3s. 2d. to 3s. 4d. per lb.

CHLOROFORM.—2s. 3d. to 2s. 7½d. per lb., according to quantity.

CREOSOTE CARBONATE.—6s. per lb.

ETHERS.—S.G. ·730—1s. 1d. to 1s. 2d. per lb., according to quantity; other gravities at proportionate prices.

FORMALDEHYDE.—£39 per ton, in barrels ex wharf.

GUAIACOL CARBONATE.—4s. 9d. to 5s. per lb.

HEXAMINE.—2s. 3d. to 2s. 6d. per lb.

HOMATROPINE HYDROBROMIDE.—30s. per oz.

HYDRASTINE HYDROCHLORIDE.—English make offered at 120s. per oz.

HYDROGEN PEROXIDE (12 VOLS.).—1s. 4d. per gallon, f.o.r. makers' works, naked. Winchesters, 2s. 11d. per gall. B.P., 10 vols., 2s. to 2s. 3d. per gall.; 20 vols., 4s. per gall.

HYDROQUINONE.—3s. 10d. per lb., in cwt. lots.

HYPOPHOSPHITES.—Calcium, 3s. 6d. per lb., for 28-lb. lots; potassium, 4s. 1d. per lb.; sodium, 4s. per lb.

IRON AMMONIUM CITRATE.—B.P., 2s. 3d. to 2s. 6d. per lb. Green, 2s. 6d. to 2s. 11d. per lb.; U.S.P., 2s. 4d. to 2s. 7d. per lb.

IRON PERCHLORIDE.—18s. to 20s. per cwt., according to quantity.

MAGNESIUM CARBONATE.—Light commercial, £31 per ton net.

MAGNESIUM OXIDE.—Light commercial, £62 10s. per ton, less 2½%; Heavy commercial, £21 per ton, less 2½%; in quantity lower; Heavy Pure, 2s. to 2s. 3d. per lb., in 1 cwt. lots.

MENTHOL.—A.B.R. recrystallised B.P., 16s. 6d. per lb. net for January delivery; Synthetic, 9s. to 10s. per lb.; Synthetic detached crystals, 9s. to 12s. 6d. per lb., according to quantity; Liquid (95%), 9s. 6d. per lb.

MERCURIALS B.P.—Up to 1 cwt. lots, Red Oxide, 7s. 6d. to 7s. 7d. per lb., levig., 7s. to 7s. 1d. per lb.; Corrosive Sublimate, Lump, 5s. 9d. to 5s. 10d. per lb., Powder, 5s. 2d. to 5s. 3d. per lb.; White Precipitate, Lump, 5s. 11d. to 6s. per lb., Powder, 6s. to 6s. 1d. per lb., Extra Fine, 6s. 1d. to 6s. 2d. per lb.; Calomel, 6s. 4d. to 6s. 5d. per lb.; Yellow Oxide, 6s. 10d. to 6s. 11d. per lb.; Persulph., B.P.C., 6s. 1d. to 6s. 2d. per lb.; Sulph. nig., 5s. 10s. to 5s. 11d. per lb. Special prices for larger quantities.

METHYL SALICYLATE.—1s. 5d. to 1s. 9d. per lb.

METHYL SULPHONAL.—9s. to 9s. 3d. per lb.

METOL.—9s. to 11s. 6d. per lb. British make.

PARAFORMALDEHYDE.—1s. 9d. per lb. for 100% powder.

PARALDEHYDE.—1s. 1d. to 1s. 4d. per lb.

PHENACETIN.—2s. 6d. to 2s. 9d. per lb.

PHENAZONE.—4s. to 4s. 3d. per lb.

PHENOLPHTHALEIN.—6s. 6d. to 6s. 9d. per lb.

POTASSIUM BITARTRATE 99/100% (Cream of Tartar).—94s. per cwt., less 2½ per cent.

POTASSIUM CITRATE.—B.P.C., 1911, 1s. 8d. to 1s. 11d. per lb.; U.S.P., 2s. 1d. to 2s. 4d. per lb.

POTASSIUM FERRICYANIDE.—1s. 9d. per lb., in cwt. lots.

POTASSIUM IODIDE.—16s. 8d. to 17s. 5d. per lb., according to quantity.

POTASSIUM METABISULPHITE.—6d. per lb., 1-cwt. kegs included, f.o.r. London.

POTASSIUM PERMANGANATE.—B.P. crystals, 5½d. per lb., spot.

QUININE SULPHATE.—1s. 8d. to 1s. 9d. per oz., bulk in 100 oz. tins.

RESORCIN.—2s. 10d. to 3s. per lb., spot.

SACCHARIN.—55s. per lb.; in quantity lower.

SALOL.—2s. 4d. per lb.

SODIUM BENZOATE, B.P.—1s. 8d. to 1s. 11d. per lb.

SODIUM CITRATE, B.P.C., 1911.—1s. 10d. to 2s. 1d. per lb., B.P.C., 1923.—2s. 2d. to 2s. 4d. per lb. for 1-cwt. lots. U.S.P., 2s. 1d. to 2s. 4d. per lb., according to quantity.

SODIUM FERROCYANIDE.—4d. per lb., carriage paid.

SODIUM HYPOSULPHITE, PHOTOGRAPHIC.—£15 5s. per ton, d/d consignee's station in 1-cwt. kegs.

SODIUM NITROPRUSSIDE.—16s. per lb.

SODIUM POTASSIUM TARTRATE (ROCHELLE SALT).—90s. to 95s. per cwt. Crystals, 5s. per cwt. extra.

SODIUM SALICYLATE.—Powder, 1s. 7½d. to 1s. 9d. per lb. Crystal, 1s. 8½d. to 1s. 10d. per lb.

SODIUM SULPHIDE, PURE RECRYSTALLISED.—10d. to 1s. 1d per lb.

SODIUM SULPHITE, ANHYDROUS.—£27 10s. to £28 10s. per ton, according to quantity. Delivered U.K.

SULPHONAL.—6s. 9d. to 7s. per lb.

TARTAR EMETIC, B.P.—Crystal or powder, 2s. 1d. to 2s. 2d. per lb.

THYMOL.—Puriss., 10s. to 10s. 3d. per lb., according to quantity. Firmer. Natural, 14s. 3d. per lb.

Perfumery Chemicals

ACETOPHENONE.—7s. per lb.

AUBEPINE (EX ANETHOL).—11s. per lb.

AMYL ACETATE.—2s. per lb.

AMYL BUTYRATE.—4s. 9d. per lb.

AMYL SALICYLATE.—2s. 9d. per lb.

ANETHOL (M.P. 21/22° C.).—5s. 6d. per lb.

BENZYL ACETATE FROM CHLORINE-FREE BENZYL ALCOHOL.—2s. per lb.

BENZYL ALCOHOL FREE FROM CHLORINE.—2s. per lb.

BENZALDEHYDE FREE FROM CHLORINE.—2s. 6d. per lb.

BENZYL BENZOATE.—2s. 6d. per lb.

CINNAMIC ALDEHYDE NATURAL.—15s. 6d. per lb.

COUMARIN.—10s. per lb.

CITRONELLOL.—13s. 6d. per lb.

CITRAL.—8s. 3d. per lb.

ETHYL CINNAMATE.—6s. per lb.

ETHYL PHTHALATE.—3s. per lb.

EUGENOL.—8s. 3d. per lb.

GERANIOL (PALMAROSA).—17s. 9d. per lb.

GERANIOL.—6s. to 10s. per lb.

HELIOTROPINE.—4s. 6d. per lb.

ISO EUGENOL.—13s. per lb.

LINALOL.—Ex Bois de Rose, 15s. per lb. Ex Shui Oil, 10s. 6d. per lb.

LINALYL ACETATE.—Ex Bois de Rose, 18s. 6d. per lb. Ex Shui Oil, 14s. 6d. per lb.

METHYL ANTHRANILATE.—8s. 6d. per lb.

METHYL BENZOATE.—4s. per lb.

MUSK KETONE.—35s. per lb.

MUSK XYLOL.—8s. per lb.

NEROLIN.—4s. 6d. per lb.

PHENYL ETHYL ACETATE.—11s. 6d. per lb.

PHENYL ETHYL ALCOHOL.—10s. 6d. per lb.

RHODINOL.—32s. 6d. per lb.

SAFROL.—1s. 6d. per lb.

TERPINEOL.—1s. 8d. per lb.

VANILLIN.—15s. 3d. to 16s. 6d. per lb.

Essential Oils

ALMOND OIL.—Foreign S.P.A., 10s. 6d. per lb.

ANISE OIL.—2s. 9d. per lb.

BERGAMOT OIL.—26s. per lb.

BOURBON GERANIUM OIL.—14s. per lb.

CAMPHOR OIL.—9d. per lb.

CANANGA OIL, JAVA.—14s. 6d. per lb.

CINNAMON OIL LEAF.—6s. 9d. per lb.

CASSIA OIL, 80/85%.—6s. 9d. per lb.

CITRONELLA OIL.—Java, 2s. per lb., c.i.f. U.K. port. Ceylon, pure, 1s. 9d. per lb.

CLOVE OIL.—5s. 6d. per lb.

EUCALYPTUS OIL, AUSTRALIAN.—2s. 1d. per lb.

LAVENDER OIL.—Mont Blanc, 38/40%, Esters, 17s. per lb.

LEMON OIL.—9s. per lb.

LEMONGRASS OIL.—4s. 3d. per lb.

ORANGE OIL, SWEET.—12s. 6d. per lb.

OTTO OF ROSE OIL.—Anatolian, 35s. per oz. Bulgarian, 65s. per oz.

PALMA ROSA OIL.—11s. per lb. nominal.

PEPPERMINT OIL.—Wayne County, 16s. per lb.; Japanese, 7s. 3d. per lb.

London Chemical Market

The following notes on the London Chemical Market are specially supplied to THE CHEMICAL AGE *by Messrs. R. W. Greeff & Co., Ltd., and Messrs. Chas. Page & Co., Ltd., and may be accepted as representing these firms' independent and impartial opinions.*

London, January 26, 1928.

THE improvement in trade continues, with markets also firm. Export trade is more satisfactory.

General Chemicals

ACETONE continues firm at £64 to £66 per ton, according to quantity.
ACID ACETIC is in active request at £37 to £38 per ton for standard 80% grades.
ACID CITRIC is firmer at 1s. 7¼d. per lb., with good inquiry.
ACID FORMIC.—Unchanged at £45 to £47 per ton, according to quantity.
ACID LACTIC.—Unchanged.
ACID OXALIC continues firm and in good demand at £30 to £31 per ton.
ACID TARTARIC is firm at 1s. 3d. to 1s. 3½d. per lb.
ALUMINA SULPHATE remains firm and in good demand at £5 15s. to £5 17s. 6d. per ton.
AMMONIUM CHLORIDE.—Unchanged.
ARSENIC.—Unchanged.
BARIUM CHLORIDE.—Steady at £8 to £9 per ton, with fair demand.
COPPER SULPHATE.—Unchanged.
CREAM OF TARTAR is very firm and price tends upwards.
EPSOM SALTS.—Unchanged.
FORMALDEHYDE.—Demand remains good, with price steady at £41 to £43 per ton.
LEAD ACETATE.—Demand continues active with firm price at £42 for white and £1 per ton less for brown.
LIME ACETATE.—Unchanged.
METHYL ACETONE is in good demand at £55 per ton.
POTASSIUM CHLORATE is firm at £28 per ton and supplies for prompt shipment remain short.
POTASSIUM PERMANGANATE.—Demand is still improving at about 5d. to 5¼d. per lb. for best grades.
POTASSIUM PRUSSIATE.—Unchanged.
SODIUM ACETATE is in very short supply. Price is advancing and demand is good.
SODIUM BICHROMATE.—Unchanged at British makers' prices.
SODA CHLORATE.—Still in short supply for early delivery. Price remains firm at £26 to £28 per ton.
SODA NITRITE.—The position remains firm at £19 10s. to £20 per ton, with demand good.
SODA PRUSSIATE.—Unchanged at 4½d. to 5d. per lb., according to quantity.

Coal Tar Products

The market for coal tar products is a little more active, but there is little change in prices to report from last week.

90's BENZOL is unchanged, at about 1s. 3d. to 1s. 4d. per gallon, while the motor quality is quoted at 1s. 1d. to 1s. 2d. per gallon.
PURE BENZOL has little inquiry, and is worth about 1s. 5½d. to 1s. 6½d. per gallon on rails.
CREOSOTE OIL remains firm, at about 7½d. per gallon on rails in the North, while the price in London is about 8½d. per gallon.
CRESYLIC ACID is rather more plentiful, and inquiry is not brisk. The pale quality is quoted at 2s. 6d. per gallon on rails, while the dark quality, 95/97%, is worth about 2s. per gallon.
SOLVENT NAPHTHA can be bought at 8½d. per gallon, with no demand.
HEAVY NAPHTHA has a little more inquiry, but the price is unchanged at about 10d. per gallon, on rails.
NAPHTHALENES are rather scarce. The 74/76 quality can be obtained at about £7 per ton, while the 76/78 quality is quoted at £8 to £8 10s. per ton, although sales are restricted.
PITCH is unchanged. The demand is relatively small, and little business has been reported during the past week. The price remains unchanged at approximately 80s. per ton f.o.b. U.K. ports.

Latest Oil Prices

LONDON, January 25.—LINSEED OIL quiet at irregular prices. Spot, £28 15s., ex mill; January, £27 15s.; March-April, £28 7s. 6d.; May-August, £29 2s. 6d.; September-December, £29 17s. 6d. RAPE OIL slow. Crude, extracted, £43 10s.; technical refined, £45 10s., naked, ex wharf. COTTON OIL dull and 20s. per ton lower. Refined common edible, £41; Egyptian crude, £36; deodorised, £43. TURPENTINE steady but inactive. American spot, 42s. 6d.; February-April, 43s.; May-June, 43s. 9d.; and July-December, 44s. 3d. per cwt.

HULL, January 25.—LINSEED OIL.—Spot to April, £28 12s. 6d.; May-August, £28 17s. 6d.; September-December, £29 10s. per ton, naked. COTTON OIL.—Bombay crude, £32 5s.; Egyptian crude (new), £34 15s.; edible refined, £39; technical, £35 10s.; deodorised, £41. PALM KERNEL OIL.—Crushed, 5½%, £38 15s. per ton, naked. GROUNDNUT OIL.—Crushed-extracted, £45 10s.; deodorised, £49 10s. per ton. SOYA OIL.—Extracted and crushed, £33; deodorised, £36 10s. RAPE OIL.—Crude-extracted, £42; refined, £44 per ton. TURPENTINE.—Spot, 44s. COD OIL.—30s. 6d. per cwt. net cash terms, ex mill. CASTOR OIL.—Unaltered.

Nitrogen Products

Export.—Since the last report a fair quantity of sulphate of ammonia has been bought for consumption in Spain, and prices in that country are now a little firmer. Elsewhere the demand has still been very quiet, but prices are a shade higher, and are quoted to-day at £9 13s. 9d. to £9 17s. 6d. per ton, f.o.b. U.K. port, in single bags.

Home.—There has been a fair demand, and orders are being booked in increasing quantities.

Nitrate of Soda.—The demand for all countries continues to be slow and prices are a shade easier.

Ontario Government's Industrial Research Fund

A comprehensive scheme for industrial research in Ontario was outlined by the Hon. G. Howard Ferguson, prime minister of the province, in a recent address before the Ontario Division of the Canadian Manufacturers' Association. On behalf of the Provincial Government, Mr. Ferguson promised a million dollars, in addition to the free use of a building, if the industries would also raise a million. The plan calls for the raising of the total fund of $2,000,000 in five years, which would provide an annual income of $100,000 for industrial research work.

South Wales By-Products

THERE is no material change to report in South Wales by-product activities. Pitch remains in only moderate demand. Prices have dropped about 2s. 6d. a ton and the product is now changing hands round about 82s. 6d. a ton. The inquiry for refined tars has widened, and the indications are that this market will experience heavy demands within the next month or two. Prices are unchanged up to the present, coke oven tar selling at from 8½d. to 9d. per gallon and gasworks tar at from 7d. to 7¼d. per gallon, f.o.r. maker's works, and from 10d. to 1s. per gallon delivered in barrels. Crude tar, which has a moderate call, continues to change hands at from 60s. to 65s. per ton. Solvent and heavy naphtha continue weak and have practically no demand. Patent fuel exports from Cardiff and Swansea have advanced a trifle, but coke exports remain unchanged. Patent fuel for export remains steady at from 23s. to 24s. a ton, while coke ranges from 27s. 6d. to 37s. 6d. a ton.

Textile Research at Leeds University

THE Department of Textile Industries of the University of Leeds has been conducting researches in relation to the colloid character of wool, and these have led to the invention of a device, now being tried out on a large scale, for imposing some of the properties of wool on artificial fibres. Other main lines of research in the department, as reported in Professor Barker's account of the work of the session 1926–27, related to the chlorination of wool and the physico-chemical properties of wool fat. In the Department of Colour Chemistry and Dyeing, satisfactory arrangements for obtaining free samples from manufacturers have made it possible to devote more attention to artificial silk.

British Standard Painting Materials

IN continuance of their programme of work in the paint and varnish section, the British Engineering Standards Association have just issued British standard specifications for black oil pastes for paints, brunswick or chrome greens (pure and reduced) for paints, gold size for paints, natural siennas for paints, natural umber for paints, ultramarine blue for paints, and red lead (non-setting) for paints (Nos. 197, 303, 311, 312, 313, 314 and 315 of 1927). Copies of these seven new specifications can be obtained from the British Engineering Standards Association (Publications Department), 28, Victoria Street, London, S.W.1.

Scottish Chemical Market

The following notes on the Scottish Chemical Market are specially supplied to THE CHEMICAL AGE *by Messrs. Charles Tennant and Co., Ltd., Glasgow, and may be accepted as representing the firm's independent and impartial opinions.*

Glasgow, January 25, 1928.

THE heavy chemical market continues to show moderate activity, and export inquiry particularly remains good. Prices remain in about the same level as last reported.

Industrial Chemicals

ACETONE, B.G.S.—£63 to £66 per ton, ex store, according to quantity.

ACID ACETIC, 98/100%.—Glacial, £56 to £67 per ton, according to quality and packing, c.i.f. U.K. ports; 80%, pure, £37 10s. per ton, ex wharf; 80%, technical, £37 10s. per ton, ex wharf.

ACID BORIC.—Crystals, granulated or small flakes, £30 per ton. Powdered, £32 per ton, packed in bags, carriage paid U.K. stations.

ACID CARBOLIC, ICE CRYSTALS.—In moderate demand, and quoted price unchanged at 7¼d. per lb., f.o.b. U.K. ports.

ACID CITRIC, B.P. CRYSTALS.—On offer at 1s. 7d. per lb., less 5%, ex store, spot delivery.

ACID HYDROCHLORIC.—Usual steady demand. Arsenical quality at 4s. 6d. per carboy. Dearsenicated quality, 6s. per carboy, ex works, full wagon loads.

ACID NITRIC, 80°.—Quoted £23 5s. per ton, ex station, full truck loads.

ACID OXALIC, 98/100%.—On offer from the Continent at 3¼d. per lb., ex wharf. Spot material quoted 3½d. per lb., ex store. In better demand.

ACID SULPHURIC.—£3 7s. 6d. per ton, ex works, for 144° quality. £6 5s. per ton for 168° quality. Dearsenicated quality, 20s. per ton extra.

ACID TARTARIC, B.P. CRYSTALS.—Still in little demand, but price unchanged at 1s. 2½d. per lb., less 5%, ex wharf.

ALUMINA SULPHATE, 17/18%, IRON FREE.—Spot material quoted £5 12s. 6d., per ton, ex store. On offer for early delivery at £5 5s. per ton, c.i.f. U.K. ports.

ALUM.—Lump potash quality quoted £8 5s. per ton, c.i.f. U.K. ports. Crystal meal, 10s. per ton less. Lump quality on spot offered at £9 per ton, ex store.

AMMONIA, ANHYDROUS.—Unchanged at about 9d. per lb., carriage paid. Containers extra and returnable.

AMMONIA, CARBONATE.—Lump, £37 per ton. Powdered, £39 per ton, packed in 5 cwt. casks, delivered or f.o.b. U.K. ports.

AMMONIA, LIQUID, 880°.—Unchanged at about 2½d. to 3d. per lb., delivered according to quality.

AMMONIA, MURIATE.—Grey galvanisers' crystals of British manufacture unchanged at £23 to £24 per ton, ex station. Continental on offer at £19 15s. per ton, c.i.f. U.K. ports. Fine white crystals quoted £17 10s. per ton, c.i.f. U.K. ports.

ARSENIC, WHITE POWDERED.—Quoted £19 15s. per ton, ex wharf, prompt despatch from mines. Spot material on offer at about £20 15s. per ton, ex store.

BARIUM CARBONATE, 98/100%.—English material on offer at £7 5s. per ton, ex store. Continental quoted £7 per ton, c.i.f. U.K. ports.

BARIUM CHLORIDE, 98/100%.—Large white crystals quoted £6 17s. 6d. per ton, c.i.f. U.K. ports.

BLEACHING POWDER.—British manufacturer's contract price to consumers, £6 12s. 6d. per ton, delivered, minimum 4-ton lots. Continental on offer at £6 10s. per ton, ex wharf.

BORAX.—English manufacturer's price unchanged as follows: Granulated, £19 10s. per ton; crystals, £20 per ton; powdered, £21 per ton. Odd parcels on offer of granulated from America at about £16 per ton, ex wharf.

CALCIUM CHLORIDE.—British manufacturer's price, £4 15s. per ton to £5 5s. per ton, ex station, according to quantity and point of delivery. Continental material quoted £3 12s. 6d. per ton, c.i.f. U.K. ports.

COPPERAS, GREEN.—Unchanged at about £3 10s. per ton, f.o.r. works, or £4 12s. 6d. per ton, f.o.b. U.K. ports, for export.

COPPER, SULPHATE.—Continental material quoted £23 per ton, c.i.f. U.K. ports. British on offer at £24 per ton, ex store.

FORMALDEHYDE, 40%.—On offer at £37 5s. per ton, c.i.f. U.K. ports. Spot material quoted £39 per ton, ex store.

GLAUBER SALTS.—English material unchanged at £4 per ton, ex store or station. Continental quoted £2 15s. per ton, c.i.f. U.K. ports.

LEAD, RED.—Imported material quoted £31 10s. per ton, ex store.

LEAD, WHITE.—On offer at £31 15s. per ton, ex store.

LEAD ACETATE.—White crystals quoted £39 15s. per ton, c.i.f. U.K. ports; brown, about £38 10s. per ton, c.i.f. U.K. ports. Spot material on offer at £42 15s. per ton, ex store, spot delivery.

MAGNESITE, GROUND CALCINED.—Quoted £8 10s. per ton, ex store. In moderate demand.

POTASSIUM BICHROMATE.—4½d. per lb. delivered, minimum 4-ton lots. Under 4-tons, ⅛d. per lb. extra.

POTASSIUM CARBONATE, 96/98%.—Rather scarce for immediate delivery. Quoted £25 10s. per ton, ex wharf. Spot material about £26 10s. per ton, ex store.

POTASSIUM CHLORATE, 99/100%.—Offered from the Continent at £25 15s. per ton, c.i.f. U.K. ports for powdered quality. Crystals 30s. per ton more.

POTASSIUM NITRATE.—Quoted £19 5s. per ton, c.i.f. U.K. ports. Spot material on offer at £20 10s. per ton, ex store.

POTASSIUM PERMANGANATE, B.P. CRYSTALS.—Quoted 6½d. per lb., ex store, spot delivery.

POTASSIUM PRUSSIATE (YELLOW).—Unchanged at about 6½d. per lb., ex store, spot delivery. Offered from the Continent at 6⅜d. per lb.

SODA CAUSTIC.—Powdered, 98/99%, £17 17s. 6d. per ton; solid, 76/77%, £14 10s. per ton, minimum 4-ton lots, carriage paid for contract. Spot material 10s. per ton extra.

SODIUM ACETATE.—In good demand and in limited supply for prompt delivery. Imported material now quoted £19 15s. per ton, ex store.

SODIUM BICARBONATE.—Refined recrystallised, £10 10s. per ton, ex quay or station. M.W. quality, 30s. per ton less. No change in price for this year.

SODIUM BICHROMATE.—Quoted 3d. per lb. delivered buyers' works, minimum 4-ton lots. Under 4 and over 2-ton lots, 3 1/16d. per lb.; under 2-ton lots, 3¼d. per lb.

SODIUM CARBONATE (SODA CRYSTALS).—£5 to £5 5s. per ton, ex quay or station. Powdered or pea quality, 27s. 6d. per ton extra.

SODIUM HYPOSULPHITE.—Large crystals of English manufacture quoted £8 17s. 6d. per ton, ex station, minimum 4-ton lots. Pea crystals on offer at £14 15s. per ton, ex station, minimum 4-ton lots.

SODIUM NITRITE, 100%.—Quoted £19 10s. per ton, ex store.

SODIUM PRUSSIATE (YELLOW).—In moderate demand and price unchanged at about 4½d. per lb., ex store. Offered for prompt shipment from the Continent at 4½d. per lb., ex wharf.

SODIUM SULPHATE (SALTCAKE).—Prices 50s. per ton, ex works, for unground quality, 52s. 6d. per ton delivered. Ground quality, 2s. 6d. per ton extra.

SODIUM SULPHIDE.—Prices now as follows:—Solid, 60/62%, £9 per ton; broken, 60/62%, £10 per ton; crystals, 30/32%, £9 2s. 6d. per ton, delivered buyers' works on contract, minimum 4-ton lots. Special prices for some consumers. Spot material, 5s. per ton extra.

SULPHUR.—Flowers, £12 per ton; roll, £10 15s. per ton; rock, £10 12s. 6d. per ton; floristella, £9 10s. per ton; ground American, £9 5s. per ton, ex store. Prices nominal.

ZINC CHLORIDE.—British material, 98/100%, quoted £24 15s. per ton f.o.b. U.K. ports. 98/100%, solid on offer from the Continent at about £21 15s. per ton, c.i.f. U.K. ports. Powdered, 20s. per ton extra.

ZINC SULPHATE.—Continental material quoted £11 15s. per ton, ex wharf.

NOTE.—The above prices are for bulk business and are not to be taken as applicable to small parcels.

West of Scotland Chemical Industries

IN the latest issue of the official journal of the Glasgow Chamber of Commerce interesting reference is made to the operations of the chemical industries of the West of Scotland during the past year. "It is difficult to separate the chemical industries of the West of Scotland," it is commented, "from those of the rest of Great Britain, especially since the formation in November, 1926, of the great combine of Brunner, Mond and Co., Nobel Industries, the British Dyestuffs Corporation, and the United Alkali Co., with a total of about seventy-five associated concerns; but it may be said generally that local works have continued to make satisfactory progress and to play their parts in national operations. The output in the fine chemical industry is more than three times what it was before the war, and this trade has taken a leading part in solving problems associated with the production on a manufacturing scale of biochemical substances discovered by research workers. In spite of over-supplies of superphosphates and the low prices which this has made necessary, new work has continued on processes for breaking down crude minerals as well as for the recovery of phosphates from one or other of the directions in which these at present go to waste."

Manchester Chemical Market

(From Our Own Correspondent.)

Manchester, January 26, 1928.

The disappointing delay in any marked improvement being shown in the position of the cotton textile industry has naturally a restrictive effect on the consumption of heavy chemical products in this part of the country, and an important influence on the volume of trade done on this market. In most other directions, however, the demand is on a fairly satisfactory scale, and hopes of further improvement during the next few weeks are held. Meanwhile, prices are steady to firm in most sections of the market.

Heavy Chemicals

There is not a great deal of business going through just now in the case of hyposulphite of soda, offers of which are on the easy side at about £9 10s. per ton for the commercial quality and from £16 to £16 5s. per ton for the photographic. Phosphate of soda keeps fairly steady at about £12 15s. per ton, and a moderate inquiry has been reported during the last few days. A fair trade is going through in nitrite of soda, current offers of this material being at between £19 and £19 2s. 6d. per ton. Bichromate of soda is in quietly steady request, and quotations are maintained at round 3½d. per lb. Caustic soda is attracting a fair amount of attention from users at from £13 7s. 6d. to £15 7s. 6d. per ton, according to quality. Sulphide of soda keeps up fairly well, although there is not a great deal of business in this material passing at the moment; the commercial grade is quoted at £8 10s. per ton and the 60–65 per cent. concentrated solid at £10 to £10 5s. per ton. Bicarbonate of soda continues to be offered at £10 10s. per ton, and a moderate inquiry for this is reported. Saltcake is on the slow side, but values remain at £2 12s. 6d. per ton in contract lots. Alkali is a fairly active section of the market, with makers quoting at £6 2s. 6d. per ton. Bleaching powder is on offer at £7 per ton to home consumers, who are taking moderate deliveries. Prussiate of soda is steady at round 4½d. per lb., and a fair trade is being done. Current offers of chlorate of soda range from 3d. to 3¼d. per lb., a quietly steady demand being reported.

Inquiry for chlorate of potash is on fairly satisfactory lines, and prices are held at about 3½d. per lb. Permanganate of potash, however, is still rather a quiet section, with the commercial material on offer at round 4⅞d. per lb. and the B.P. at 5¼d. Buying interest in carbonate of potash is of moderate extent, with supplies available at from £25 15s. to £26 per ton. Caustic potash is well maintained at the recently improved level of £33 5s. per ton, on one- to five-ton lots, for prompt delivery; a quietly steady business is being done. Yellow prussiate of potash is steady and meets with a fair demand at 6⅝d. per lb. Bichromate of potash is currently offered at round 4¼d. per lb.

The demand for sulphate of copper is fairly active and values keep up at about £25 per ton, f.o.b. Offers of arsenic continue to be made at from £17 15s. to £18 per ton, at the mines, for white powdered, Cornish makes, but the demand for this is not very pressing at the moment. Nitrate of lead is slow and easy, although at £37 10s. per ton values have not actually changed. Acetate of lead is on the quiet side, with brown quoted at about £39 per ton and white at £40 to £41. Supplies of acetate of lime are still rather short and values are firm at round £16 15s. per ton for grey and £10 10s. for brown.

Acids and Tar Products

Current quotations for citric acid range from 1s. 6¾d. to 1s. 7d. per lb., and a moderate business is being put through. Oxalic acid is rather quiet at up to 3½d. per lb. There is not much moving at the moment in the case of tartaric acid, but quotations are about maintained at round 1s. 2¾d. per lb. Acetic acid is meeting with a quietly steady demand and values are firm at £66 to £67 per ton for glacial and £37 for the 80 per cent. commercial.

Pitch shows little improvement in sales and the tendency is easy, round £3 15s. per ton, f.o.b., now being quoted. Carbolic acid is about maintained at 7¼d. to 7½d. per lb. for crystal and 2s. 4d. per gallon for 60's crude, a quiet trade being reported. Creosote oil is well held at about 8d. per gallon, and the demand, particularly on export account, keeps up. Solvent naphtha is moving off rather slowly at from 10¾d. to 11d. per gallon.

Low-temperature Carbonisation by the Dvorkovitz System

A demonstration of the Dvorkovitz system of low temperature carbonisation was given recently at Slough, where there is a setting of two retorts, each with a capacity of five tons a day, which is the size proposed as a unit for commercial installations. The essential feature of the system is that the coal, crushed to lumps of from ½ in. to a maximum of 2 in., is treated in a vertical retort heated outside by producer gas, and on its downward passage is scrubbed by heated gas introduced at the top and in the middle of the retort. This gas is brought into close contact with each part of the coal, so that the oils in the form of vapour are removed before the mass becomes appreciably plastic. The upper and lower parts of each retort are separated by a valve which enables the treatment in the upper part to be completed before the charge is fed into the lower part. At the bottom of each part an off-take is provided for the gas and vapours, from which they are led to washing, condensing, and purifying apparatus.

The temperatures employed vary with the class of coal, and in the setting at Slough, provision is made to give control of temperature sufficient to enable the setting to deal with different varieties of coal at what is believed to be the best temperature. Generally, the temperatures are notably lower than is customary. In the flues surrounding the retorts, they vary from 500° C. at the top to 400° at the bottom, and the superheated gas entering the top of the retort varies from 300° to 400°. It is claimed that cracking of the oil and formation of aromatic products are thus avoided, and that owing to the penetration of the mass by the gas throughout the process the residual coke is readily powdered, imposing less wear on a pulveriser than is usual with cokes produced at higher temperatures and under other conditions. The coke from an ordinary coal contains, it is stated, only 6 to 7 per cent. of volatiles.

The Journal of the Royal Technical College

The most recent number of the *Journal* of the Royal Technical College, Glasgow, has just come to hand (No. 4, December, 1927. Printed and published by Robert Anderson, Glasgow, pp. 128, 10s. 6d.). The *Journal* is published at intervals in order to record some of the research work carried out in the college by the staff and senior students. The present volume contains the following papers of chemical and metallurgical interest: "Further Studies in Double Salt Formation. I.—The Formation of Copper Sodium Sulphate. II.—The Formation of Manganese Potassium and Ammonium Sulphates," by Professor R. M. Caven and W. Johnson; "The Conductivities and p_H Values of Mixtures of Acids in Solution," by J. A. Cranston and J. Duncan; "δ-Substituted Semicarbazides," by I. V. Hopper; "Preparation of *p*-Nitrobenzylbromide," by I. V. Hopper; "Some Acyl Derivatives of Hydrazine," by Professor F. J. Wilson, W. Baird, A. C. Brown, and E. C. Pickering; "The Yield-Point in Steel at Various Temperatures," by Professor J. Muir; "The Bending of Steel Overstrained by Tension," by Professor J. Muir and D. Binnie; "Tempering Changes in Carbon Steels," by R. Hay and R. Higgins; and "Diesel-Engine Performance on Oils Obtained from the Low-Temperature Carbonisation of Coal," by J. S. Brown. The *Journal* is excellently produced and printed, and reflects great credit on the energy and enterprise of the college authorities.

Long Service Recognised

Five workmen who have been in the employment of W. Blythe and Co., Ltd., chemical manufacturers, of Holland Bank Chemical Works, Church, Lancashire, for forty years and upwards, have each been presented with a valuable semi-hunter solid gold watch, and another workman with a cheque in appreciation of a suggested improvement submitted by him which has been adopted by the firm. The gifts were handed to the recipients on Saturday, January 21, on the occasion of the annual dinner, concert, and dance given to the employees of the firm. The guests numbered nearly 500. Mr. W. Collison, joint managing director, presided, supported by several gentlemen prominently identified with the firm. The gifts were presented by Mr. Collison, who warmly complimented the recipients upon their loyal and long service.

Company News

BEMBERG ART SILK CO.—A dividend of 15 per cent. is announced.

CONSETT SPANISH ORE.—An interim dividend of 2s. per share, less tax, is payable on February 13th.

NEW TAMARUGAL NITRATE CO.—The local board in Chile have declared an interim dividend of 3 per cent. for the year to July 31, 1928.

SOUTH METROPOLITAN GAS CO.—The directors recommend a final dividend of 3¾ per cent. on the ordinary stock, making 6¼ per cent. for the past year.

BLUNDELL, SPENCE AND CO.—A dividend of 5 per cent. is announced on the ordinary shares, half of which is payable on February 11 and half on August 31.

ELLIOTT'S METAL.—The company announce an interim dividend, payable on February 1, of 2½ per cent. on the preference shares and 3 per cent. on the ordinary shares, both less tax.

BRITISH PLATINUM AND GOLD CORPORATION.—The report for the year ended June 30 last states that the debit balance of profit and loss amounted to £30,049, after allowing £17,679 for depreciation of plant, etc.

ENGLISH CHINA CLAYS, LTD.—The directors announce the payment of a dividend on the cumulative preference shares at the rate of 7 per cent. per annum for the half-year ended December 31, 1927, to be paid on February 1.

ENGLISH VELVET AND CORD DYERS CO.—The company announce a final dividend of 5 per cent., making 7 per cent. for the past year, adding £10,000 to the reserve and £5,000 to the workpeople's benefit fund, and carrying forward £19,629.

ACHILLE SERRE, LTD.—At a meeting of the holders of the preference shares, held on Wednesday, at the Great Eastern Hotel, London, resolutions were passed enabling the company to issue debentures or debenture stock to the nominal amount of £150,000, carrying interest at the rate of 6 per cent. per annum, and giving the company power to create further debentures or debenture stock not exceeding £100,000.

GAS LIGHT AND COKE CO.—A dividend for the half-year ended December 31 last at the rate of £5 1s. 4d. per cent. per annum is recommended by the directors on the ordinary stock, making a total of £5 0s. 8d. for the year, the same as last year. The accounts of the company for the past year show that, subject to audit, the balance to the credit of the net revenue account will enable the directors to recommend the payment of the dividends on the 4 per cent. consolidated preference stock at the rate of £4 per cent. per annum, and on the 3½ per cent. maximum stock at the rate of £3 10s. per cent. per annum. The sum of £121,577 is carried forward to the next account.

"B AND L" POWDERED FUEL CO.—The statutory report states that the total number of shares allotted is 60,000 preferred ordinary of £1 each and 300,000 ordinary shares of 1s. each as follows: 55,000 preferred ordinary shares of £1 each, on each of which £1 per share is presently payable in cash; 5,000 preferred ordinary and 300,000 ordinary shares of 1s. each, allotted as fully paid for consideration other than cash. The total amount received by the company in respect of shares issued wholly for cash is £53,692 10s. Payments up to January 11, 1928, are as follows: On account of purchase price payable in cash, £18,000; investment in subsidiary company, Continentale Kohlenstaubfeuerung A.G., £1,500; plant and machinery, £1,000; preliminary expenses, £1,711; revenue payments (less receipts), £980; leaving balance at bank £30,500. The preliminary expenses are estimated at £1,782.

South African Department of Chemistry

THE Division of Chemistry of the South African Department of Agriculture has just issued its annual report for the year ended June 30, 1927, under the title "The Key to the Secrets of Nature: The Indispensable Work of the Chemist." The Division maintains three series of laboratories, one at Pretoria, one at Johannesburg, and one at Capetown. Notes are given on soil investigations; irrigation water; fertiliser experiments; fruit investigations; the arsenical contamination of fruit; the spraying and sulphuring of fruit; foods and drugs and Customs work; forensic work, etc.

New Chemical Trade Marks

Applications for Registration

This list has been specially compiled for us from official sources by Gee and Co., Patent and Trade Mark Agents, Staple House, 51 and 52, Chancery Lane, London, W.C.2, from whom further information may be obtained, and to whom we have arranged to refer any inquiries relating to Patents, Trade Marks, and Designs.

Opposition to the Registration of the following Trade Marks can be lodged up to February 25, 1928.

"CASOPHALTE."

477,542. Class 4. Bitumen, raw, or partly prepared for use in manufactures, for export from the United Kingdom of Great Britain and Northern Ireland to and for sale in countries other than the Irish Free State. Anglo-Mexican Petroleum Co., Ltd., 16, Finsbury Circus, London, E.C.2; merchants.—February 7, 1927.

"FLUXPHALTE."

477,543. Class 4. Bitumen and asphalt for export from the United Kingdom of Great Britain and Northern Ireland to and for sale in countries other than the Irish Free State. Anglo-Mexican Petroleum Co., Ltd., 16, Finsbury Circus, London, E.C.2; merchants.—February 7, 1927.

"PYRIDIUM."

484,454. Class 4. Dyes. The Pyridium Corporation (a corporation duly organised and existing under the laws of the State of New York), 20, East 12th Street, New York City, New York, United States of America; manufacturers.—September 29, 1927.

Chemical Trade Inquiries

The following inquiries, abstracted from the "Board of Trade Journal," have been received at the Department of Overseas Trade (Development and Intelligence), 35, Old Queen Street, London, S.W.1. British firms may obtain the names and addresses of the inquirers by applying to the Department (quoting the reference number and country), except where otherwise stated.

GUR AND MOHWA SEED DISTILLING PLANT FOR JAIPUR.—Tenders are invited by the Indian Stores Department, New Delhi, and will be received up to February 16, for the supply and delivery of a distilling plant capable of distilling 350 London proof gallons per day of 12 hours from wash obtained from Mohwa seed or from Gur. (Reference B.X. 4,161.)

DISINFECTANT FLUID.—The Egyptian Department of Public Health are calling for tenders, which will be received up to March 28, for the supply of 51·7 metric tons of disinfectant fluid. (Reference B.X. 4,163.)

DRUGS AND CHEMICALS, ETC.—The Department of Public Health, Cairo, is inviting tenders for supplies for the year May 1, 1928, to April 30, 1929, of drugs and chemicals, galenicals, etc. Tenders will be received by the Director of Stores, Department of Public Health, Cairo, up to noon on March 29, 1928. (Reference B.X. 4,172.)

CHEMICALS (INCLUDING POTASH, ALUM, COPPER SULPHATE, SODA ASH), PHARMACEUTICALS AND DRUGS.—A well-established Indian commission agent in Bombay is desirous of obtaining further agencies of British manufacturers and exporters. (Reference 76.)

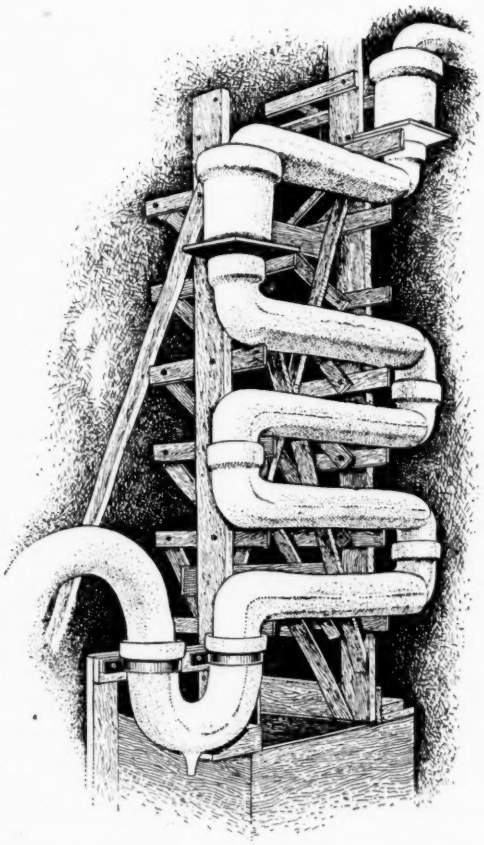
CHEMICALS AND DRUGS, PAINTS, VARNISHES.—A well-established Parsee firm of commission agents in Bombay are desirous of representing British manufacturers. (Reference 78.)

ANTI-CORROSIVE PAINT, ETC.—The directors of the South Indian Railway Co., Ltd., invite tenders up to February 3, for the supply of anti-corrosive paint, moist white lead, etc. Specification and forms of tender will be available at the company's offices, 91, Petty France, Westminster, London, S.W.1.

Tariff Changes

POLAND.—The "conventional" duty on ferro silicon containing more than 30 per cent. of silicon is now 7 instead of 4½ zloty per 100 kg.

The "VITREOSIL"



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System of HYDROCHLORIC ACID ABSORPTION

THESE VESSELS set up Vertically one above the other can be thoroughly Water Cooled.

Economies of Floor Space and Efficiency of Operation are secured. There are no submerged joints.

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ABC Code, 5th & 6th Editions, & Bentley's used

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Commercial Intelligence

The following are taken from printed reports, but we cannot be responsible for any errors that may occur.

County Court Judgments

[NOTE.—The publication of extracts from the "Registry of County Court Judgments" does not imply inability to pay on the part of the persons named. Many of the judgments may have been settled between the parties or paid. Registered judgments are not necessarily for debts. They may be for damages or otherwise, and the result of bona-fide contested actions. But the Registry makes no distinction of the cases. Judgments are not returned to the Registry if satisfied in the Court books within twenty-one days. When a debtor has made arrangements with his creditors we do not report subsequent County Court judgments against him.]

BRITISH OIL PAINT AND CHEMICAL PRODUCTS CO., 50, Walton Village, Liverpool, chemical manufacturers. (C.C., 28/1/28.) £14 4s. December 2.

SURREY VARNISH AND ENAMEL CO., LTD., 26, Buckingham Gate, S.W., varnish makers. (C.C., 28/1/28.) £19 7s. 4d. December 8.

WILLIAMS (FRANCIS) AND SON, 48, Scrutton Street, E.C., manufacturing chemists. (C.C., 28/1/28.) £15 12s. 10d. November 28.

Mortgages and Charges

*[NOTE.—The Companies Consolidation Act of 1908 provides that every Mortgage or Charge, as described therein, shall be registered within 21 days after its creation, otherwise it shall be void against the liquidator and any creditor. The Act also provides that every Company shall, in making its Annual Summary, specify the total amount of debts due from the Company in respect of all Mortgages or Charges. The following Mortgages and Charges have been so registered. In each case the total debt, as specified in the last available Annual Summary, is also given—marked with an *—followed by the date of the Summary, but such total may have been reduced.]*

SCOTT (JOHN) AND CO. (LONDON), LTD., manufacturing chemists. (M., 28/1/28.) Registered January 10, £1,600 debenture to R. M. Harrison, Maer Hall, Newcastle, Staffs; general charge.

Receivership

GILLIS (A.) AND CO., LTD. (R., 28/1/28.) R. G. H. Adams, of Dowlais Chambers, West Bute Street, Cardiff, was appointed receiver on January 5, 1928, under powers contained in debenture dated September 24, 1927.

London Gazette, &c.

Winding Up Petition

STANDARD SOAP CO., LTD. (W.U.P., 28/1/28.) A creditors' petition for winding-up has been presented, and is to be heard at the Royal Courts of Justice, Strand, London, on Monday, January 30.

Companies Winding Up

MERCER WARD, LTD. (C.W.U., 28/1/28.) Winding-up order, January 16.

SENIOR CROZIER AND CO., LTD. (C.W.U., 28/1/28.) Winding-up order, January 16.

SUTER CAMPBELL OILS, LTD. (C.W.U., 28/1/28.) Winding-up order, January 16.

VAUXHALL CHEMICAL CO., LTD. Last day for receiving proofs for intended dividend, February 8. Liquidator, H. E. Burgess, Senior Official Receiver and Liquidator, 33, Carey Street, Lincoln's Inn, London, W.C.2.

New Companies Registered

THE BRITISH CEMENT CORPORATION, LTD. Registered as a "public" company on January 23. Nom. capital, £5,000 in £1 shares. To acquire and deal with shares, stock, debentures, debenture stock, annuities, bonds, obligations and securities of any company engaged in the production or marketing of cement; manufacturers of and dealers in cement, stone, lime, asphalt, bituminous rock, petroleum, liquid rubber compounds, chemicals, concrete, macadam and other products. A subscriber: O. J. Hook, 70, Holmwood Road, Seven Kings.

JOHN HARE AND CO. (COLOURS), LTD., Bath Bridge, Bristol. Registered January 20. Nom. capital, £30,000 in £1 shares. To acquire the business of John Hare and Co. (Colour Works) and to carry on the business of manufacturers of and dealers in crude and fine colours, paints, white and dry white lead, white lead in oils, white lead paint, red and orange lead, litharge, flake litharge, ship's anti-fouling composition, floor polishes, etc. Directors: C. F. A. Hare and T. Day.

IVANHOE MACHINERY CO., LTD., St. Peters Lane, Leicester. Registered January 23. Nom. capital, £1,000 in £1 shares. Engineers, machinists, manufacturers, factors, merchants, builders and repairers of and dealers in machines of every description, manufacturers of boot and shoe polishes, stains, dressings, oleaginous and saponaceous substances, pigments, paints, dyes and ingredients, etc. Directors: W. L. Grant and J. W. Bamkin.

Exhibition of Quarrying and Builders' Plant

THE popularity of the exhibition of Quarrying Plant and Machinery and Building Plant and Materials to be held in June for the third consecutive year, can be gauged from the number of exhibitors who have already booked up spaces. This year Stanley Park, Blackpool, is the place chosen, and all the largest spaces, and many of the smaller, are taken by exhibitors who have also been at the first two exhibitions. Some larger spaces than any formerly offered were arranged for this year, and these were all booked up by wire and telephone as soon as the plan of the Exhibition was circulated. Among the exhibitors are Tangyes, Ltd., of Cornwall Works, Birmingham; Imperial Chemical Industries, Ltd.; The Cambrian Wagon Co., Ltd., of Cardiff; Fodens, Ltd., of Sandbach; The British Road Tar Association; Beecroft and Partners, Ltd., of Sheffield; Hadfields, Ltd., of Sheffield; Blackstones, Ltd., of Stamford; R. A. Lister and Co., Ltd., of Dursley; Crossley Bros., Ltd., of Manchester; Broom and Wade, Ltd., of High Wycombe; Ruston and Hornsby, Ltd., of Lincoln; The Hardy Patent Pick Co., of Sheffield; and Thomas and Bishop, Ltd., of London.

Benn Brothers' Other Journals

THE CABINET MAKER.—Special London and Exhibition Number: Exhibition Prospects; New Books; Retailers' Furniture Windows; Preliminary View of the Wholesale Furniture Exhibition at Olympia; Cane Furniture for the Spring Trade.

DISCOVERY.—The Automatic Telephone and How it Works; "Television in America," by W. Brittain; "The Marsh Warbler's Mimicry," by E. W. Hendy; "World Airways of the Future," by A. E. Blake; Among the Stars: Book Reviews.

THE ELECTRICIAN.—Special Overhead Lines Number; "Overhead Transmission," by G. R. Falkiner Nuttall; "Steel Cored Aluminium Conductors," by E. T. Painton; "Overhead Distribution Problems," by J. T. H. Legge.

THE EXPORT WORLD.—More About B.I.F.: Ground Plans for London and Birmingham Sections; Packing Points for Exporters—Results of Commercial Tests (illustrated); Sports Goods for the Argentine and Sports Trade Export Advertising; Farm and Garden Tools for Brazil; Insights into British Industry: VII—Morris Motors.

THE FRUIT GROWER.—"Apple and Pear Thinning," by E. A. Bunyard; N.F.U. and Food Council; Potato Manuring.

GARDENING ILLUSTRATED.—Hard Weather and its Effect on Plants; Foots Cray Place (II) (illustrated); "A Dwarf Juniper and Primula denticulata," by Edwin Beckitt, V.M.H.; Success with Early Peas; Pruning Fruit Trees.

THE GAS WORLD.—"Manufacture of 400 Calorific Value Gas," by W. H. Stephenson; Notorious Company Promoter Sentenced to Penal Servitude; "Refractory Materials for Vertical Retorts," by Dr. E. Steinhoff.

THE HARDWARE TRADE JOURNAL.—Electro-depositing Standards; Railway Rates for Light Castings: The Burden of the Scottish Ironfounders; Cutlery and Electro-plate Notes; The Radio Counter.

THE TIMBER TRADES JOURNAL.—Timber Trades Benevolent Society; Annual Meeting; Timber Position in the Bordeaux District; The Saw Tooth.